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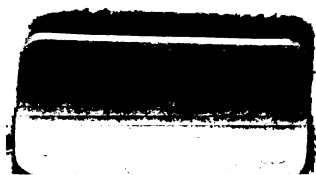
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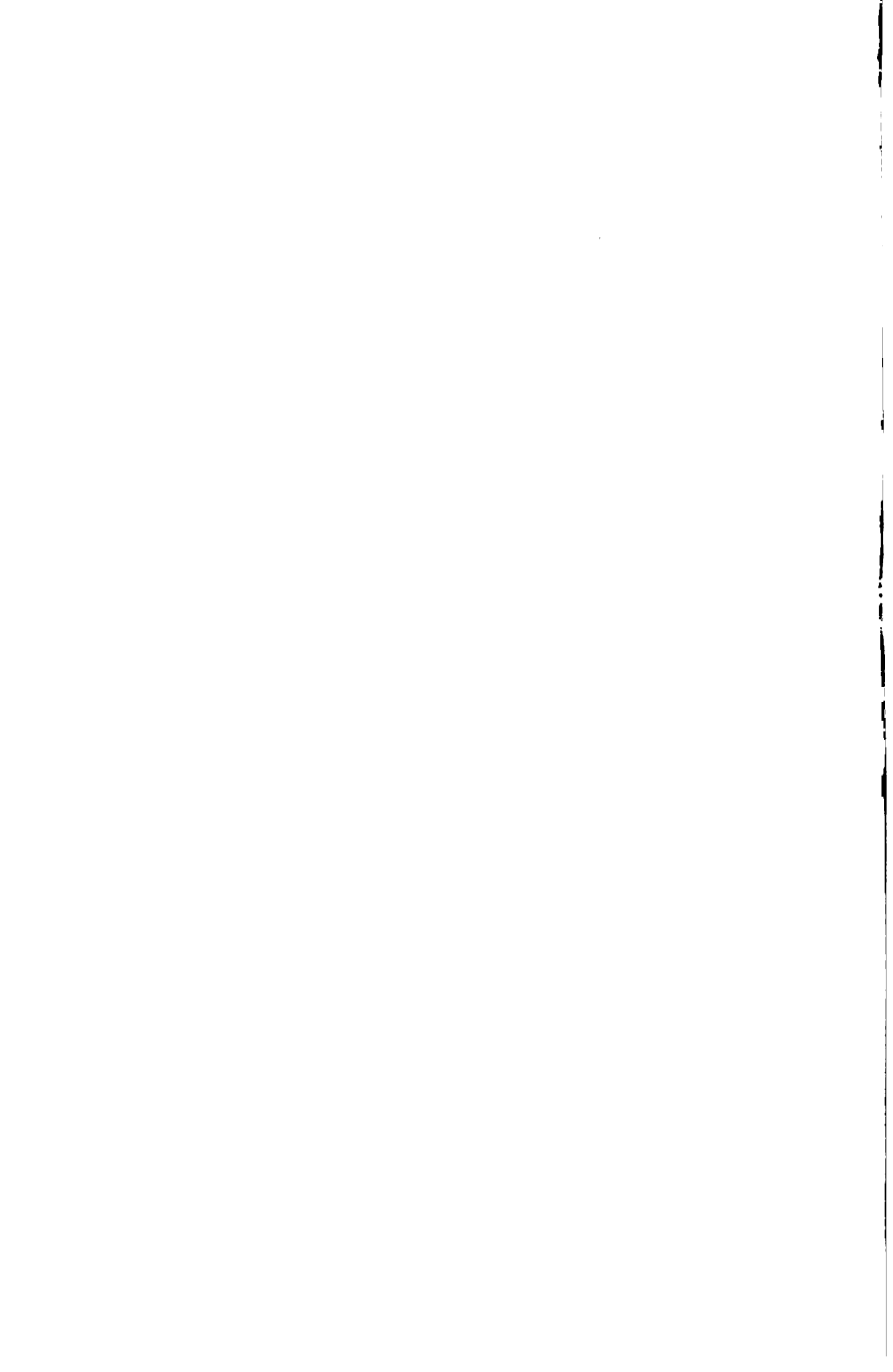
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THE NEW INDUSTRIAL DAY

THE NEW INDUSTRIAL DAY

BY
WILLIAM C. REDFIELD



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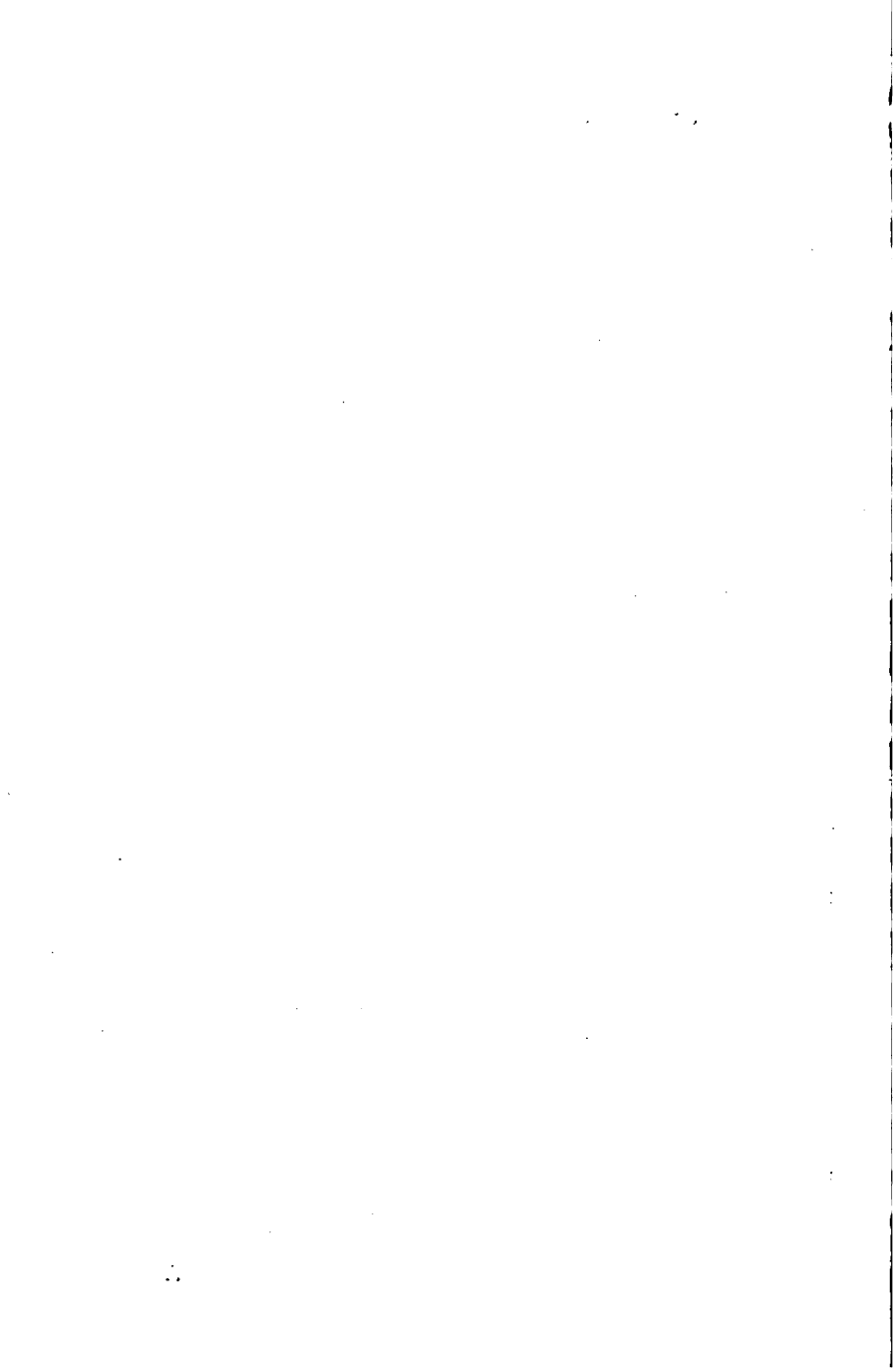
**TO THOSE FRIENDS AT HAMMER, MACHINE AND
VISE WITH WHOM IT WAS MY PRIVILEGE TO
BE LONG ASSOCIATED, WHOSE LOYALTY HAS
ENDURED THROUGH YEARS AND WHOSE CON-
FIDENCE HAS ALWAYS BEEN AN INSPIRATION.**

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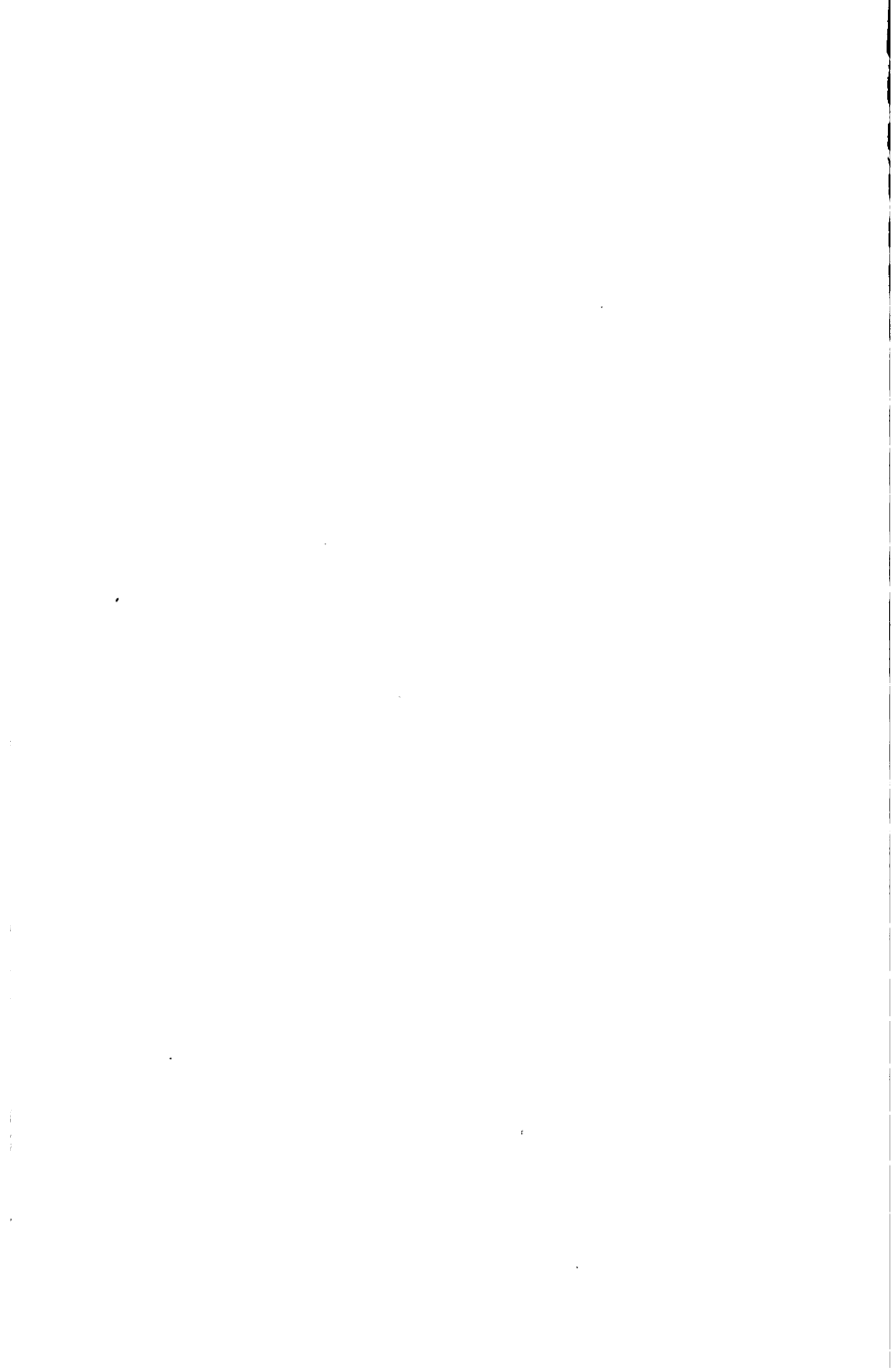


FOREWORD

It is in the hope that we may come to see more clearly the right values among us, and that seeing them, we may come to use them better, and that using them better, we may conserve them, that this book is written. If it shall help to add to the appreciation of man for man, if it shall aid to take away the unnecessary burdens placed by man on man, if it shall in any degree lead to the happier and more productive working of man with man, its purpose will have been fully served.



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CHAPTER I

WEALTH AND WASTE

AMERICA must have seemed a land of almost incredible plenty to the early Colonial settlers. Coming as they did from well populated countries of limited area which had often felt the blasting breath of war and which had long been fully cultivated so far as the agricultural knowledge of that day permitted, they were for the first time face to face with large abundance. The land stretched out on every side challenging their capacity to occupy it and with the forest promised materials for every common need. Behind them, they saw in the old world restrictions on every side; before them, they looked into the mysteries of a new world in which the prospect was limitless. By reaching out their hands they won from the scanty population of their adopted country whatever they wished in area and in these broad acres they found resources lavish beyond their dreams.

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And necessity was upon them to use this opportunity to the full. Insistent demands for food, for clothing, for shelter allowed them no rest until they had taken freely of the goodly heritage that had fallen to them. This they did amid a plenty that was strange and with a largeness of opportunity that was inspiring. Where there was so much to be had there was small need, indeed small opportunity for saving, for the strife with the land and the forest and the Indian foe was long, fierce and unrelenting. The problems of winning their way were more than sufficient to fill their thought. Why should they think of waste or saving when there was at hand more than could possibly be used?

Under such conditions began the growth of civilization on this continent and under like conditions it long continued to expand. As the demands of the people grew they were met with supplies apparently as free as the air. The thought that there might ever come a time when the resources of nature would need careful husbanding probably never occurred to them at all. As with the conquest of the land the waves of population surged westward and the country became more fully known this outlook

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of abundance grew; as the prairies of the central west were brought under the plow; as the stores of coal and iron were developed; as later the riches in petroleum and in gold and silver became known, these all in their turn added to the inherited feeling that this was a country of plenty whose wealth was to be used with a freedom as generous as the enormous extent of the country itself. Indeed, the very variety of the riches provided by nature stimulated their lavish development. The abounding life of the expanding young nation eagerly sought and spent the bounty which nature gave, and out of this vast abundance and its free use by a growing people has come that rapid advance in the material side of our national life which has made our progress the wonder of the past century.

It is a magnificent epic, this story of the material conquest of America, as full of heroic figures, of fierce combats, of movements of mighty forces as any Iliad, as pregnant with promise for the future as was the Roman poet's legend in the *Æneid*. After almost three centuries of ceaseless struggle, ending in a material victory beyond the dreams of the avarice of old, now comes the need to take sober thought of what is and is to be.

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For the three centuries of material conquest and of rapid rise in power have had two unexpected results. They have seriously modified the character of our people and they have made plain to us that the resources of our land have their limits.

At the very time when we have developed a national habit of wastefulness, we have come also to realize with something of a shock that our natural wealth no longer permits continued wasteful use. It is but a few years since men thought of America almost as the fabul d El Dorado, and now we talk of conservation of our resources and face the problems of child labor and the sweat shops and the evils arising from congested population. Cry for a living and sufficient wage is heard among us and the protest against working hours that exhaust.

There are not lacking examples of the wastefulness with which we have dissipated our inheritance. The bison which roamed in countless thousands over our western plains were a great national asset which, used with care, would have provided food and other valuable products which we now greatly need. The buffalo was wasted—killed with a reckless hand till he almost ceased

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to be, and now, "with painful steps and slow," we are trying to bring back the herds which once roamed innumerable over the plains. Forests covered the land, promising a permanence of their products had wise care conserved them. But under the pressure of immediate need and the sense that there would always be enough, the forests have gone—wasted largely by fire and by other preventable causes till now the States and the nation have stepped in to protect a water supply which has in many places already been threatened through the wasteful treatment of the forests that guarded it.

The waste from fire is becoming familiar to us all. We seem until recently to have acted on the theory that it is better to build and burn and rebuild than to build once for all, and are just beginning to learn how costly this process is. We have paid in pensions over four and a half billions of dollars since the Civil War ended, and there are those who think this vast sum a serious burden upon us; but we have burned up since the Civil War several times that amount, and if our full fire loss per capita can be brought down to the level of that in England or Germany, we shall save in the next twenty years more than

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enough to make good all that has been paid for pensions in these past fifty years, and can pay every dollar of our national and state debts besides out of the saving thus made.

We are wasteful of life itself. What we have done with the bison, with our forests and through our fires, we have done also with the lives of our people. Look back through the last forty years and note the deaths from railway and industrial accidents. Include with these the lives lost through needless fires. Reckon among them the Iroquois Theater and the Triangle fire, the Brooklyn Theater and the Collinwood School House, and consider that most, if not all, of these deaths were preventable. But we need not stop here. No one who is well informed will question that about forty per cent. of the deaths in our country to-day are needless — are from the public standpoint a waste of life. They occur through preventable causes, and means are known and are available to prevent the causes from operating. We can save the lives of some five hundred thousand people a year if we choose, and we are beginning to choose.

Much of the waste and the loss both of natural resources and of life are the price we have had

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to pay for progress, and our power, our comforts, our efficiency, all that make up the material side of our national life, are the results that we have bought at this price. The paying of this price was undoubtedly largely inevitable as a part of the cost of the nation's growth. But now that we have, so to speak, found ourselves, need this price be longer paid? May we not have a still more prosperous and happy America based upon an energy which shall be no longer reckless in its expenditure of resources or life? For there is room all about us for the use of effort of hand and brain in saving of waste and in producing at a less fearful cost than we have hitherto paid. We must stop the losses from the waste of human labor, waste from fatigue and waste through preventable illness and deaths.

For whether we look with the eyes of the altruist or of the economist, we shall see, if our vision is clear, that the greatest value in America lies in our men and our women. We have had as a nation to strive so hard, first for existence, then for growth and then for power; we have had to put so much force and thought into the struggle for political and industrial life; so much energy has necessarily gone to developing our

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material resources, and so much now goes to the use and spending of our wealth that we have too much overlooked the fact that all these together are of little worth compared with the value of human life and welfare.

If American men and women are our most valuable possessions — more valuable, for example, than material wealth — then the getting of material wealth at the cost of injury to men and women becomes an economic mistake, a national injury as well as an ethical wrong. The price is too high to be paid. The nation cannot afford to waste its best for anything less valuable. If a great state loses its sense of right values so far as to permit its children to be exploited to their injury in mills or mines in the effort for wealth, or to refuse to protect its men and women from excessive hours of labor, then that state has become disloyal to its best self; is wasting its finest values, and its action or its inaction means the loss of that which it should be its chief function and pride to preserve and which it needs more than all else. Wherever the labor of children prevails so as to stunt or injure childhood or to prevent these children from developing into a healthy and rounded manhood or womanhood,

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then he who attacks that system as one which destroys our best values, is a conserver of the state; and he who for his personal profit would maintain that system, is a destroyer of our best and becomes a menace to the state.

Examples do not fail in history to show us what befalls a nation which loses its sense of human values. Rome in the fourth century seemed still to sit secure and strong upon her Seven Hills, ruling the world with every outward semblance of power. She had wealth and organization and military force and at times great leaders, but the greatest asset of a nation was lacking — she lacked *men*. Many slaves, much luxury, much money was hers, but the high and fine values in men and women were missing and she fell before the strong manhood that was in the Goth.

We look with horror upon the days of human sacrifices to the false gods of old. We shrink from the bloody ceremonies of the Aztecs and the Druids and their like, and we have evolved so far that in all our latter-day religions we shed no blood to appease the Deity. But can it be said that human beings are no longer sacrificed on the altar of ignorance or neglect? Are the in-

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dustries unknown in which at least a chance of such a sacrifice is taken? Are there no men in places of power who weigh rather too carefully what it will cost to make things safe? Risks must be taken, to be sure, but how far is the risk taken as a matter of course, and how keen the effort to reduce the risks? When it means lives against profits, do the lives always win?

It needs no peculiar vision to see that there is unrest among us. Great moral forces rise in tides of protest against conditions that cramp or cripple many of our people. The cry against special privilege nurtured by law is one form of this protest. The cry against a distorted industrialism, seeking by the law of grasp to reach wealth, regardless of those whom it may crush or injure in its path to riches, is another form of this protest. The cry for shorter hours of labor and for the protection of the women and children who toil is a normal protest against the fatigue that destroys. The call of labor for a larger share in the products of industry is the normal response to the efforts of many masters in industry to get too great a share for themselves. The demand for the restraint by law of the powers that prey, is a righteous call out of

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the sad experience of those that have been preyed upon.

After three centuries of development and a century of industrialism, in which land and resources and people have been exploited chiefly with the desire and, indeed, the need of getting riches, we have begun to take a more accurate account of our national values, and in this inventory comes clearly out the priceless worth of the great asset we have mentioned — our people themselves. They are the first thing and beside them all else is secondary. For all of them, and not a few of them alone, do our nation and our laws and our civilization and our industries exist. There is no righteousness and there will be no peace growing out of partiality or special privilege. The way to crime and chaos lies plainly in the exploitation of our men and our women as if they were coal or oil. In our free America there is to be industrial and social freedom. Out of the ferment of unrest there has already begun to come a truer sense of human values; a better adjustment of law to those values; a keener conscience as to the treatment of those values, and a conservation which shall not stop with saving water or wood, but will make its

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greatest and most fruitful task the conserving of our people themselves.

In the doing of this mighty, multiform and complex task, those who would conserve the best value in America take both an advanced and a progressive position. They do not hesitate to teach the doctrine that the people who work in our mills are of more value to the state than the product of those mills. They believe and fearlessly say that it is much more to the interest of the public that the wages paid in those mills shall be righteous than that the owners of those mills shall profit largely. They insist that profit at the top, arising from penury at the bottom, is a wrong to us all that shall not be endured. They do not hesitate to say that hours that overstrain the nerves and muscles of our people injure us all, and that a sufficient rest is as much a reasonable right as is a living wage. They condemn without reserve the importation of ignorant labor, only to exploit it at pitiful pay in industries that are not efficient. By instinct they look first and foremost for the welfare and the uplift of those who need the most and possess the least, and their outreach is toward those who

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strive hardest in life's battle rather than toward those who have won that fight. Their thought is not first for the classes that are secure, entrenched by position and wealth and power against those ills to which all flesh is heir, but rather for those who are bearing the "burden and heat of the day," struggling upward on the common levels of life, hoping here in our land to find that which shall make life broader and sweeter for their children than it has been for themselves. The true lover of America finds fellowship with those who, while they have been fortunate in the strife of life, have not lost the "common touch" that distinguishes the patriots of to-day; those who prefer to stand, if need be, on the lower levels, lending a hand to lift their fellow beings upward, striving toward the larger and the better day, rather than, themselves secure, to call upon others to rise unaided to the heights on which they stand. On the one hand there is the spirit of companionship and mutual effort; on the other hand too much the spirit of condescension and of pride.

But while we take this progressive ground, we do so with a true conservative instinct, for salvation lies only along the lines of progress.

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Things cannot stay as they are. There is work to be done. There are conditions to be changed. There are readjustments to be made. We must go forward or we shall fall backward, and the progressive spirit sees clearly that the things it would attack and the evils it would destroy are menaces to the prosperity of our industries, as well as injuries to the body of our people. It looks, as is elsewhere said, for industries which freed from illusive protection at the hands of law, shall become self-reliant and strong, and in so looking, it uses the eye of a friend and not the mask of a foe. It looks to see our people freed from the excessive waste of fatigue and from the grasping power of those who would exploit them for profit, and in so doing knows that it builds up our industries and our commerce on the only permanent and enduring basis. It recognizes that every form of privilege for the benefit of the few involves the risk of dangerous reactions, but that growth on right and normal lines is the only progress in which there are no reactions.

The modern spirit in America, progressive and therefore truly conservative, having a keen sense of true values among us, believing deeply in the

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infinite worth of all the people, has set its face to the task of correcting the things that here and now are wrong. It does not assume that it will be easy to do this, or that it can be done in a day or a year, but to the doing of the task it will address itself with all of courage and of patience that the task requires, and having put its hand to the plow it will not turn back. It will still strive for wealth but with a larger knowledge of that in which real wealth consists. It will strive to prevent waste, and especially that waste of human effort and health and life which injures and, if unchecked, will destroy the best values we possess.

CHAPTER II

THE DAYS OF THE RULE OF THUMB

IF we have correctly understood the causes which have led to the wastefulness which has been so marked a characteristic of our material development in America, we shall expect to find that a study of our industrial life will show that a like tendency to waste has existed also there. Any observer of our industrial growth must be astonished at the results of what seems less like a normal expansion than some almost explosive force by which in a few decades our industries have sprung from the little to the large — from the infant stage to that of giants. Men, who are not yet old, recall when this was predominantly an agricultural country, and the tradition yet remains in force among us, but to-day the products of our industries are greater than those of any other two nations in the world, and as this is written new records are being made in output, so that neither the past nor the present form a safe measure of what the future shall be.

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The industries of the nation have not sprung within a man's lifetime from childhood to heroic size without showing signs of that disregard for details which makes waste, and that strong striving after results which often pushes to one side as a minor detail the relative cost at which those results are had. So, side by side with the great achievements of our manufacturers, we should normally look to find that the profits arising from these achievements have been won at a higher price of waste of all kinds than it will be longer possible to pay, and that the day has dawned in which a sober second thought must be taken and our methods readjusted. For our industrial past has truly passed not to return. We can grind no longer with the water that has run under the mill. Conditions are not and ought not to be what they have been. The day of rough and ready contest as with the bludgeon and the fist has gone in our industrial fight, and we must use keener and more accurate weapons and carry on the contest at longer range and with more trained antagonists than those with whom until recently we have had to deal.

As yet only the men of vision — the few far sighted captains of industry — have grasped and

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acted upon this new outlook. So splendid have been the results of our industrial growth, so brilliant the victories of our manufacturers at home and abroad, so astonishing the inventive skill with which by special tools and new appliances we have reduced the cost of our production, so matchless has been the courage with which some of us have forsaken the old and taken up the new, that we are apt to lose sight of the fact that these achievements and this brilliancy and fine courage have been the characteristics of the few rather than of the many, and that most of our industries are still laggards in the race.

The day of the "rule of thumb" in our factories is not yet ended, though its sun is setting. Many superintendents manage to-day as they managed of yore — true offspring of the industrial conditions under which they grew up. There is fearful waste of energy, of human strength and thought and even of life, and waste also of time and of material and of attention given to relatively trivial things while more serious matters pass unnoticed. We have depended much heretofore on mere drive, or as we call it "hustling" — crowding into the compressed hours of busy days more and more, and winning out by in-

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tensity of effort and by dint of strenuous application rather than by the scientific efficiency which saves all waste and applies the principle of the least effort to produce the greatest result.

There are still men representing the old type who say with pride that they have never taken a vacation, as if such waste of human vitality, such failure to restore the normal drain on strength, could ever be wise or creditable. Some of us have inherited from the needs of our fathers a doctrine which almost says that work merely as work, exertion purely as exertion, effort merely as effort, is itself a desirable thing. There are many among us, too, who from habit or necessity, and, in part at least, as a result of training keep on doing well and planning well and managing well according to "rule of thumb" standards, without thinking whether there may not be some better, easier, more productive and less costly method.

Any radical change in factory management must be a gradual evolution out of that which has preceded it. The present systems, or lack of systems, with their good and their bad points are themselves the result of long evolution. No drastic or radical change in them can be suddenly

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or even rapidly made without causing disturbance. Men have become accustomed alike to the strong and the weak elements in the systems under which they work, and they cling naturally to that which they have been accustomed to do. A factory manager is a busy man. From dawn to dark problems large and small press on his thought. Questions of policy, of principle, of practice, of purchase in every form crowd his hours. Amid these cares, often while doing his best, he is conscious that there are better ways, but having only one man's strength he cannot take them up, especially if he has owners above him who are content with anything so long as it pays.

During a short talk the factory manager of a large Eastern plant making machine tools was asked: "Suppose all care for operating details were taken off your mind and your entire time and thought were concentrated on searching criticism of your own equipment and methods, would not your whole time, if thus spent, be profitably employed?" He replied: "It would drive me mad; there would be so much to do." This was a prosperous and long established business in a modern shop and under what is thought

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good management. Yet the superintendent knew so much improvement was possible, if his time and thought were wholly given to self-study, that he dreaded to undertake so exacting a task, necessary and profitable though he knew it to be.

The truth was that like many another able manager he was dealing with a mass of current details arising from the necessary operation of his works, and his time was too full to permit him to give to the serious task of improvements the continued and severe study it required. So as others do, he did his best, keeping his shop moving, making a change here and there, bettering conditions as time and circumstances permitted, but knowing always that there were better methods which he had not time to study as he desired; and the customers of his concern and the public and his employers paid the bill; and not they alone but the workmen in his shop bore a share of the burden for by so much as the equipment and the management were poorer than the best, the workmen were held back in their production and their earning powers were reduced. In like manner since the product of these works was not made in the easiest and cheapest way, the customers had to pay for it. For a

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similar reason, too, the concern was at a disadvantage as compared with others using more efficient plant or methods, because it had to charge a price enhanced because of its higher costs in order to make a living profit. They did complain of trouble in meeting foreign competition while admitting they could but did not improve their own methods.

A gentleman in Cleveland, Ohio, was recently called to examine six plants in one industry — all prosperous and contented with themselves. The result of his study was that the best of the six was running at 78% of a normal and possible efficiency, and the poorest was operating at but 30% of a fair and reasonable standard which was common to all six. But they did not know this; profits were good and they were happy. The “rule of thumb” was in full operation and so long as it paid, why change? They were doing well, along lines that seemed justified by experience. They did not at all realize that a five cent piece — so to speak — was being held so closely to their eyes that a dollar at a distance was invisible. None the less they and their workmen and the public using their goods were all sufferers from the waste of time and energy

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and manhood under this complacent management.

I was employed years ago by two manufacturing firms neither of whom had any cost accounting system. By one it was considered quite needless. The experience of the owner and the foremen told them without records what they thought were the proper costs. In the other place an attempt to show the proprietor the actual facts as to what his goods cost brought down his wrath on my defenseless head. In both places the "rule of thumb" was supreme and stayed supreme till in accord with normal economic laws both concerns wound up.

An agent of the Tariff Board recently visited sixteen concerns in the knit goods industry to determine the cost of their output. None of them knew what it cost them to produce their goods. The Tariff Board man had to find it all out for himself because no accurate records existed in any of the establishments. There was no such thing as a good accounting system in any of the sixteen factories and the ideas of the owners were vague and hazy on the cost of production and still more so on how to find it. One of them said the government ought to employ men to go about and teach them how to keep their costs.

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In the fall of 1911 a friend told me that the head of a large woolen manufacturing company telephoned him to come to his office; that he had something unique to show him. My friend went, and told me the thing he was shown certainly was unique. The woolen manufacturer had put together in one column all his outlay for the year — wages, expenses, interest, taxes, fuel, everything; and in another column opposite he had put the total yards of cloth made that year. Then he divided the total outlay by the total yardage, and said to my friend: "Look at that. There is what my goods cost me per yard last year. Did you ever see anything like it?" And my friend, with a straight face, told him he never had. This mill was producing about forty different kinds of goods, varying in width, weight, weave and material. The company did not know the cost of each. Still less did it know the cost of each separate operation on all or any, nor could it tell from accurate records whether each department was running at a profit or at a loss. It was the "rule of thumb" again.

Anyone who is familiar from the inside with many of our industries knows how far most of our factories are from operating under exact and

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carefully ascertained standards. And it is equally true that the industries in which the "rule of thumb" most largely prevails are often those most unconscious of its presence. It was the head of a prosperous concern that spoke with great pride of his machine shop and yet that very day a machine in that shop was found by a keen critic to be working at but one eightieth of its possible capacity. The owners of another plant were justly proud of its standards but a lathe was found there doing but one fortieth of its normal duty. Nor must it be thought that these are isolated cases of badly managed factories carefully culled to make a point. On the contrary the plant is widely known to almost everyone, and has had a long and honorable career in which not long since a planer was found operating indeed but doing almost no work at all.

But the "rule of thumb" takes various forms. It may mean absence of precise standards and careful adjustment to them in factories otherwise well operated, or it may mean a supine contentment with conditions that ought to be intolerable. Facts of this latter sort appear plainly in the report of the Tariff Board on Wool and Manufactures of Wool of December 20, 1911.

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It is hard to believe that the following words come from a manufacturer who is running a modern industry — they seem rather to be a voice from out of the “stone age” of machine production,— “The old mills for all practical running purposes are as good as the new. There are certain wearing parts in a machine which, if renewed from time to time, keep the machine as good as new. This will apply to all machinery. Where the mill has a good machine shop, and where the standard of mechanical conditions is high, whenever a machine is not ‘right’ it will be stopped and made ‘right.’ If that is maintained, *age is not serious.*”

Those final words, “age is not serious,” show a fine disregard for advance or progress (if there has been any) in that particular industry. To this calm and contented spirit all that twenty years have meant of improvement in design, quality or efficiency is as nought. This score of years have given us the automobile, the aëroplane, the wireless telegraph and the submarine, but the march of the minds of the world has gone by this mill owner unheard, and the acclaim for progress passes by him “as the idle wind” which he respects not. We are not surprised to learn

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that in this industry a large part of the machinery has been in use for twenty-five years, or that much of our clothing is made from the product of these antiquated relics of an older and a worse day.

It is within a year that the proprietor of a large mill, in answer to my question where he kept his costs, said to me "in my head," and went on to say that he had thought of putting in a modern cost-keeping system, that he supposed it was possible to learn what each operation in his large plant was costing, but that it would involve an outlay of some thousands of dollars, and that he had never gotten to it yet.

One of the officers of an association comprising many of our largest manufacturers told me a short time ago that "within the last few years" many of the manufacturers represented in his association had *begun* the keeping of costs. Yet the most superficial knowledge of how the cost of goods varies in different factories making similar products should set men searching and studying their own ways. Wood pulp varies in labor cost from 98 cents per ton to \$5.90 per ton, and the cost of turning 36-in. coach wheels varies fivefold in different railway repair shops.

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But the operation of the "rule of thumb" has not been confined to America. Illustrations of it can be found abroad also. Some years ago I took an order from a British bicycle factory for a lot of forgings to be made in America and sent to England for machining. When the details of the order had been taken down the buyer was asked what allowance for finish should be left upon each surface. He said 1-8 in. Thinking of the fine plant of special American machinery that the English manufacturer had installed and of what American custom was in the use of such machinery, one felt sure the man had made a mistake. I said to him: "So much as that? Our rule is to allow 1-32 in. and in some cases as little as 1-64 in." The customer was annoyed. He said that he wished to be serious, and intimated that it was no use to attempt to make Yankee yarns go down, or words to that effect. I had to yield, with the result that the English manufacturer not only paid for a lot of metal for which he had no use, but did in his own shop four times the amount of work that was necessary with the normal result of that waste upon his output.

Yet there is no doubt that our English friend could have made out on the surface a good case

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for himself. Was he not in actual operation of a large and successful business doing just this very work? Had the years and study he had devoted to his own trade gone for nothing? Why should he, running a shop in England and familiar with the best practice there, take the statement of an American salesman as to the custom in another country, merely because he happened to be using American tools for certain work?

English manufacturers have been justly considered ultra-conservative, but there are many American managers who know that the leaders in English industry are both active and acute men who no longer use the "rule of thumb," and both English and American manufacturers know, or ought to know, that their German competitor is he who has best cast aside traditions and whose example should spur us all to shaking off the shackles that bind us to a past from which we have indeed learned much that is good but have also inherited that which hampers us. The conservative in industry, however, as in other things has always a case. He is the man who talks about dealing with facts and not with promises. He is always practical, not theoretical. He is always sure that while one or another

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course may be satisfactory in other places, it is not suited to his business. I doubt if there is any more wornout excuse than this just mentioned of something which has worked elsewhere not being suited to this or that or the other particular business. When other grounds fail he often falls back upon plain incredulity for there is a type of man to whom "I don't believe it" is an all-sufficient argument.

I was speaking in Congress one day of the difference in output between conservative English methods and those of some alert American manufacturers. A colleague in his reply asked: "Is it not absurd to suppose that crossing the water changes a man's efficiency?" Surely, but methods differ. On the Peninsular and Oriental steamer that brought me from India was a large manufacturer of leather goods from the city of Philadelphia. He related the incident that on one occasion two young men who were leather finishers, we will say — I am not sure about the process, but it was a hand process in the manufacture of leather — two young Englishmen applied to him for employment, and he happened to go with them out in the mill where the work was done. He said he would be glad to take them on

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if they could perform the regular stint of work.

"Well," they said, "how many is that?"

He said, "One hundred and twenty a day."

"No, no," they said; "no man could do that and live." They had been accustomed to doing fifty a day in England, and that is all they could do, and all they thought any man could do.

"Well," said the proprietor, "I am a practical leather man, and I will show you." He took his coat off and worked some time to illustrate, and when he had finished found he had been working at the rate of 150 a day. The two young men left because they were not willing to work up to the ordinary American standard of production.

The illustration of what is possible in the way of improved methods can be multiplied from many sources and from different industries. Mr. H. L. Gantt, in his recent book, "Work, Wages and Profits," tells his experience in a cotton mill. After establishing an accurate cost system and training the workers in their duties, it was found that the average wages of the workers increased forty per cent. The product increased eighty per cent, and the labor cost per piece was but sixty per cent of what it had been, and there were other savings.

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I recall that at one time, when giving a good deal of thought to the scrap heap in our factory yard, I was concerned about one particular kind of light scrap metal for which no ready market was known and which had to be sold at a very small price to get rid of it at all. Casting about to find who could enlighten us on the subject, we learned of a large hinge manufacturer not competing with us, who produced much more of such scrap than we did. Feeling sure we could learn from him some way of dealing with this scrap so as to find a market for it at a better price, we wrote to him and asked his method of disposing of it. His answer was, "We just wheel it out in the yard and sell it the best way we can." In other words, he was neglecting this by-product. By keeping at it as time permitted, we found a man who wanted this material, if we would prepare it for his use, and was willing to pay much more for it thus prepared than the price at which it had theretofore been sold. I have often wondered whether my friend, the hinge maker, still wheels his scrap out in the back yard and sells it for the best he can get, and if he has ever thought his scrap heap worthy of sufficient study to find out what the best he can get is.

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There is hope in the coming of the word "scientific," now so closely associated in much of our industrial literature with management, for that which is scientific means something done with accurate knowledge, and one of the great needs of our industrial life is this knowledge. For strange and incredible as it may seem, the first truth the so-called "efficiency engineers" proclaim is that neither owners nor operators, taken at large, know very much about the details of the business in which both are engaged. All students of what is called "scientific management" agree on this and they have many examples to prove it — some of them, to the writer's own knowledge, from among the industries and in the concerns longest established and supposed to be most closely managed.

And just here the most serious trouble is found by those who would teach "scientific management," for it is agreed by them all that it is the owners and managers who are hardest to teach, who have the most to learn and who approach the problem with the least open minds. The Bourbon is not wanting in our industries. He asks, "How can a man who has not carried on my particular business instruct me in it?" He in-

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sists that, while doubtless in details faults may be found with his management, in all essential elements it is sound and good. Is it not the result of years of careful study? Has it not grown from small beginnings to its present size? Has it not been consistent with dividends and with the accumulation of a surplus? Is not the stock of his company above par and honored as the basis of loans in many banks? What more? His economics conform to the good old accepted standards. He will buy machinery, material and labor as cheaply as he can. He knows the law of supply and demand. He is intimately familiar with his mill methods; rather prides himself on being in advance of some of his competitors; has the best equipment that he knows, arranged as well as anybody knows, and operated as skilfully as any rival's. Surely it is not possible that he is but in the primary stages of his own business education,—that is to him a laughable conclusion, although there are times when the great mills made for production lie long idle and the competitive markets are taken from them.

Yet it is in the very industries where these ideas prevail that some of the greatest lapses in

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efficiency and much of the greatest waste is found; where methods are most lax and "rule of thumb" most widely prevails. To an outsider it appears that such men would be in the constant practice of the keenest self-criticism — they have so much at risk; their money, their reputation, and the property of others is in their hands. Does it not seem normal that such men should turn an open mind to him who would teach that which they need to know? Yet but a few months since a friend employed to examine into the operation of a large mill presented his report to a very irate manager, for the officer on reading the report found that it chiefly dealt with him and his ways, which was not the kind of instruction that was welcome, and he would have none of it. So his mill moves on wastefully and blindly because of the closed mind of its chief owner. Against this old condition the new scientific spirit in management cries out in protest. It would throw a keen light of ascertained facts into every dark corner of industry, and first of all into the manager's office. He may be right in his views or he may be wrong, but modern methods of managing say to him, "Find out whether you are right or wrong, abandon

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prejudice, tradition, custom, habit; stand, as it were, outside of yourself, and look at yourself coldly, calmly, clearly, to see whether you are what you think you are or not." In this, at least, no one will quarrel with the advocates of efficiency save those who object to this keen self-analysis.

It would be to the advantage of every manufacturer if he could apply to himself the words of an experienced and keen manager who said, "If I don't know why I know what I think I know, then I want to know," and equally applicable are the words of the head of a prosperous business in Rotterdam who keeps this phrase printed on a card above his desk, "Every man I meet is my master in some point, and in this I learn of him." Fortunately for American industry there are many among us who, having been through that analytic process and come out on the hither side, recognize themselves industrially as re-formed men — formed anew into a different outlook and wider knowledge and a broader grasp of the things with which they thought they were familiar before.

What is the conclusion of the matter? Methods based on guess-work or on rule-of-thumb

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— must pass away. They are not always or even usually coincident with success. They account for much if not most industrial failure. But where success exists in spite of them they are too often hugged to the breast as “our ways of doing,” and their vicious nature is unstudied and unknown.

Manufacturing has now become a profession and must be approached in the same professional spirit with which a physician or a lawyer carries on his work. It is the man of open, yet balanced mind who will win. No methods are good merely because they are general in use. No equipment is the best possible because it is what we or others use. The custom of the trade may be, and often is, a bad custom.

The manufacturer to-day must not only know but know why he knows. He must learn to distinguish the man with vision from the visionary, not only to see the things which are but to deduce from them those things that ought and are to be. His final proof must no longer be, “It pays.” No longer can a manager say to himself when he buys a machine, “This is an investment,” and when he hires a man, “This is an expense.”

The industrial manager of to-day must take a

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different attitude toward labor from that which has been common in the past. The day when the largest output was asked for the smallest wage is passing, not to return, for that theory of production is being proved false and expensive. It has been coincident with such waste in other ways, and provocative of such expense in many forms, that with increasing knowledge it has been outgrown and is being discarded.

The keen and careful manager of a modern plant will rather follow the law of the greatest output and the greatest wage. His thought will go to the reduction of his burden charges, to removing the cost for repairs, to keeping his producing machines moving through the largest possible percentage of the working day, to stopping the production of "seconds," to providing the uninterrupted flow of material, to cutting out the waste of time and effort; and in these productive ways he will find his time so profitably occupied that the payroll may be forgotten, save that he will, to the extent that he is wise, see that it is commensurate with the productiveness of his operatives. We may even hope that ere long he will come to say with true pride: "We pay the largest wages, and we have, therefore, the lowest labor cost."

CHAPTER III

“WHAT HAVE WE GOT TO DO WITH ABROAD”

IN speaking to a fellow Member of the House of Representatives recently of what I consider the great commercial value of the Philippines, he, being one of those minded to get rid of those islands as quickly as possible, was kind enough to say to me that he preferred “principle rather than pelf.” I wish emphatically to protest against the idea which prevails too much to-day—that the business world is largely a world of plunder.

It is true that the selfishness of some has reflected to a degree upon us all, but for that reason it is more necessary to affirm, as I now do, that the business men of America are, with rare exceptions, upright and high-minded men, respecting the rights of others, conscious of their duties to their fellows, seeking prosperity through service rather than through selfishness, and with personal consciences never so active and with public ideals never so high as to-day.

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Commerce is the ally of progress and develops, not destroys. But it is a far more complex thing than it once was. Our business life touches now questions of public policy, questions of human interest, matters of social uplift. Others claim the right to supervise our business affairs as never before, and a righteous and watchful public opinion requires us in some degree to be our brothers' keepers whether we will or will not. Commercial life is difficult enough without what an editor has recently called "the ebullitions of parochial statesmen" to add to our many cares. Never was sanity of public thought more needed than to-day.

Many of us as children were taught that our isolation on this continent, separated by broad oceans from the older worlds, was a great benefit, and we grew up, perhaps, with the idea that we were sufficient unto ourselves. But as we have become older new facts have forced these provincial views to the rear and now we face another outlook. For years we have known that the farmers and the millers of the Central and Western States have depended largely on foreign markets for their living. It would have gone hard with Minnesota and Dakota and

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other States in the past if England had not needed food. But we had no sooner become accustomed to the idea that we were a great food-exporting nation than the picture changed. Wheat and flour no longer reign in our export trade; our manufactures have taken their place. And not only are we exporting manufactures, but the proportion of them grows. They form now over forty-five per cent. of our total exports, while foods of all kinds have sunk to eighteen per cent. This great change, whereby the output of our shops has taken the place of the products of our farms, has gone on so quietly that now we realize it almost with a shock. It runs counter to much that we have accepted hitherto. I seem to recall that there were men who once said we needed a high tariff wall to keep us from the invasion of the products of the pauper labor of Europe, but now all of a sudden, as it appears, we from the hither side have o'erleapt the wall and found profitable markets beyond it.

In these markets, however, we are not alone. There are others beyond that wall.

While we have been bringing our total output of manufactures to where they are worth twenty

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thousand millions yearly, a like yet different progress has taken place elsewhere. Germany in her thorough, studious way has gone scientifically to work to develop herself. Her population expands with great leaps; has grown one-half in what seems a few years. Her soil is by no means virgin territory. Her natural resources, compared with our own, are not large, but he who grasps what Germany has done with the resources she has, can no longer be an enemy of conservation here. To intensive study of forest, farm, and factory at home she has added industrial expansion abroad; has tied the continents to her with steamship lines, and placed her banks at strategic points all round the globe, so that the German merchant finds the German ship and the German banker ready to aid him in buying and selling German manufactures in Valparaiso or Yokohama, or almost wherever he may be; and German exports of her manufactures have grown until they form two-thirds of her total exports and increase. Her export sales of her manufactures are greater than ours. They are backed by the most perfect public and private organizations on earth, by schools in which men are trained from their

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boyhood to the patriotic and lucrative purpose of expanding German trade. In the application of training, science and organization to business and industrial development Germany has no peer. Not long since a German, interested in the steel industry, said to a friend going there: “If you think our ability to produce steel cheaply in Germany depends upon the wages we pay, you will find when you get there that you are wrong. It is on the perfection of our organization that our industries are based.”

Outside the wall we have built around ourselves is another than Germany — namely, England. If, with our great resources and broad area, we rejoice over an export trade of manufactures of a thousand millions, being five per cent. of our total product of manufactures, may not the Englishman be justly proud that in 1909 he sent abroad from his contracted little island fifteen hundred millions in value of manufactures, or over seventy-eight per cent. of his total exports? Indeed, so recently as 1907, his foreign sales of manufactures were over seventeen hundred millions, eighty per cent. of his foreign trade, and the best estimate available is that the United King-

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dom exports its manufactures in the proportion of one to five, being a percentage of manufactured exports of more than three times our own. This solid trade rests upon a substantial base of the greatest mass of free capital in the world and upon a banking system as free and flexible as the air and as universal, and upon control of shipping that places the products of English mills wherever the English seller wills them to go, by lines controlled in his own interests. Thus, briefly, I have sketched the trinity of great competitors beyond our tariff wall. There are others, but Great Britain, Germany, and we are "the big three." We must stay there or shut down our shops. We have gone out into the world because we must. The product of our mills, our men and our minds has grown so large that it has burst through territorial and traditional lines. Even while we have sought protection from others, those very others have become our customers.

For many years the great expanse of our own land and the demands of its increasing people gave our factories enough to do. As time went on our shops waxed large and their output grew larger, till one day we found, some of us, that

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we were making that which we could not sell at home. Looking over the edge of the wall we found people there who liked what we had to sell and were willing to pay for it. We sold it to them; we found that habit pleasant, and the habit has grown. But observe that the foreign market has been the normal outgrowth of a domestic market; that one is not antagonistic or abnormal to the other, but the natural supplement to it. Just so it is abroad. England's great internal trade is the basis on which her foreign trade rests, and the export trade of Germany is the outcome of her great domestic commerce. They, indeed, approach the export market on a basis more like necessity than we, for our domestic demand is enormously greater than theirs, and yet there are shops in America that would not run full time to-day were they to lose their export trade. Our foreign trade is also a safety valve that relieves the pressure of over-production at home.

So, almost without knowing it, we have become one of the three greatest factors in the world's commerce in manufactures, and the door of a golden opportunity has swung wide open. If, like the Senator of a few years past, one were

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to ask, "What have we to do with abroad?" the answer would be, "We have everything to do with abroad." Let us therefore question frankly, What shall we do with this opportunity? That depends on what it means to us. Are times ever slack in American shops? Are there days when the shop superintendents more than catch up with the sales managers, when the wail of the salesman is heard in the land and the leaves of the order book are unfilled? Do there come weeks of part time and of men laid off, with sad homes to which to go, since there is no work to sustain them? Have there been anxious hours when costs were great because output could not be made sufficient in the market that was available to distribute the burden charge widely enough to make things pay? Some have known what it means to have a plant made for production lie idle, eating its head off. Sometimes it happens that there is some product one could cheaply make but which one's particular market did not want. Perhaps there was some by-product that could be made if we knew where it could be sold. For these and similar ills the door of opportunity that lies open affords a remedy. Out there beyond the

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There are many men of many minds, some of whom will like what we make, or will buy what we would make if we could sell it, or who can use enough of our present product to add to the output of to-day that which shall make the whole cost less per unit. Suppose we all go out into the larger world and try as others have done. A thousand automobiles monthly go from this country abroad, and Detroit prospers. I have seen the products of many American cities on the other side of the globe.

But when we go beyond the three-mile limit we shall not find all plain sailing. There are some troubled waters on that business sea, and our craft will need steering just as it does at home. Toy boats do not navigate those waters. The German and the Englishman are not easily beaten on their own ground, and they have hitherto had to help them certain of our own domestic ghosts. It is strange that so practical a people as we should be ghost worshipers, but we have been, and some of us still are. One ghost, called the “Rate of Wages,” has long stalked about on top of the tariff wall and scared us with his ferocious visage. He has a fellow ghost called the “Cost of Production,” of

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which we shall have more to say in the following chapter. While many of us, fearful of these specters, have feared to cross the wall, the Englishman and the German have fattened and grown rich, somewhat at our expense.

The United States is the youngest competitor of the three, so far as relates to the world's market. One need not go back far to find the time when our export trade in manufactures was negligible. We have not yet the enormous free wealth of Great Britain, we lack the scientific organization of Germany, we are without foreign shipping and almost without foreign banks. We have, however, as one great resource the peculiar initiative of the American, his inventiveness, that spirit which makes the progress in our shops so rapid that six months ago with many of us is ancient history, that alertness, that mechanical imagination which reaches many a result long before the German by research has sought it out or the Englishman has contemplated a change.

Let us go a bit deeper in our analysis. Great Britain must export or starve industrially. Therefore, the outlook of the English manufacturer is a world-wide one. From his earliest

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start at industry he has thought of things abroad. A factory in his country whose market is wholly at home is relatively rare. By every instinct and training he is an exporter, and the great system that backs him up has grown out of the necessity of his case and the political power of his Empire responds to and fills the need.

In Germany a rapidly growing population in a country that can not expand in area and which has, on the whole, limited natural resources must expand commercially or must commercially die. The German people alone can not absorb the product of the highly trained German mind and hand. The German has a peculiar genius for organization, and seeing his great competitor, Great Britain, established throughout the world he has by organization and study developed that which she lacks and has become a serious and a menacing competitor with her. The German manufacturer may, because of the larger population of his land, find a larger home market than Great Britain, but it is true of him also, though in lesser degree than with his English rival, that he must export his product; hence he, too, finds his outlook into the world's markets a normal one.

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Here in America the reverse is true. For a century or more we have been developing our industries with a sole regard to our domestic needs, but of late years a change has come. Our industries have so grown that their output when run continuously at full time is greater than our home market will take at its best, and when times are dull here there is a large surplus of unsold goods. Out of this condition has grown first the wish and then the need to obtain foreign markets. Out of this same background has grown the peculiar outlook of the American manufacturer upon the foreign field. To him it is not or has not been the chief market he seeks, but rather an incidental one. His output has been meant for home consumption first and secondarily for sale abroad, and it is as yet only in exceptional cases that he has come to realize the great value of the foreign markets to him and to know that they may be as valuable a part of his permanent field as are his customers at home.

Therefore, we American manufacturers enter the foreign campaign with certain handicaps. Our competitors regard the foreign markets as their primary work, we as our secondary work.

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They must have them to survive. We want them to add to a market already large. They strain every nerve, commercial and governmental, to secure and maintain them. We have nothing but private initiative, the alertness of mind of our manufacturers, and our peculiar inventive genius and restless energy upon which to depend. Yet despite these handicaps we have become a mighty factor in the foreign field. The day when American manufacturers could not compete on even terms with the producers of Europe has largely passed, and our opportunities are enlarging as our outlook broadens.

This brief and inadequate sketch of the broad conditions affecting our export trade leads naturally to the question how we shall add to that we have already won. It has been found that our peculiar capacity for making and using mechanical devices and labor-saving apparatus of all kinds has enabled us to make our way even against strong and established rivals. It is well known that the products of American factories are selling all over the world, competing in price, or quality, or design, or all of these elements combined, with the products of

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Germany and England. So true is this, so well do we like the taste of that we have already had that we cry for more. Those who have already fully developed the field need little information, but those to whom it is as yet an untried quantity may be helped by suggestions.

What the American manufacturer needs to begin and develop in export trade may be classed under two heads — general requirements and special requirements; or perhaps it is better to say, large things and little things.

In the first place, then, much depends upon his own mental outlook upon the foreign field. Just here many an American has come to grief. If a foreign market be regarded as an incident or a flyer amid the constant pressure of a large domestic trade, to receive attention when he needs sales, and to be neglected at other times, then he would better give up thought of any serious export business. His rivals in Germany and Great Britain are on the job all the time. The American who competes in this haphazard way may through a lucky chance, or the interest of some export commission house, receive some orders, but if they come when domestic business is pressing and are treated at such times as of

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comparative unimportance, or if the details of the foreign order are considered unworthy of special notice and something other than that ordered is substituted which it is thought will do as well, then farewell to the growth of the foreign business for him. The German will be there searching out just what that man wants, and the Englishman will be offering him goods whose standard quality will not alter for decades together, and no haphazard way of getting or treating foreign orders will long survive that kind of competition. An American manufacturer to secure foreign trade must take it seriously, must be prepared to invest in it with a view to its future development, just as he does at home, to regard it as of equal interest in due proportion to its size to his home trade, to cater to one as he does to the other, and to treat the foreign trade with a patient faith in its growth if his goods and methods are right, because he should know before he starts in that it is “long-distance” business that can not be hurried, and which if it is ever to flow as a river must begin as a brook.

Having determined that he will patiently and steadily develop a foreign trade and, so to speak,

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“stand the gaff” of expenditure upon it while looking for future results, he must next remember that the foreigner will not buy from him because he is an American, and that the foreigner may be quite right in saying that American designs, sizes and styles do not suit him. The American manufacturer must expand his vision. Many a one of them only sees to the three-mile limit. He must, to succeed, put himself to some degree in his customer's place, study his wants and offer him that which he wants to buy, rather than that which he, the manufacturer, wishes to sell. Therefore, the American manufacturer should go, if he can, or send to that foreign market and acquire his knowledge of it at first hand. He must, indeed, learn a good deal through others, but these others will tell him what it is to their advantage for him to know and no more, and if confined to that, he will work with second-hand knowledge. He would not do that at home. He can not long continue to do it abroad. His European competitors know just what they are doing, and the American must learn to do likewise.

He will speedily find that many goods are offered more cheaply than he produces them,

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and at once will be forced to decide whether he will lie down or stand up. In the former case he will conclude that the low efficiency of his labor or the high rate of wages he has to pay make it impossible for him to compete abroad, and that the home markets are best for him. If he is minded, however, to stand up he will enter upon a merciless course of self-criticism. He will believe that nothing in his own business is right till he has tested and proved it so. He will be dissatisfied with his plant, his methods of management, of production, of handling men, his costs, his overhead charges, with everything. He will not wait for his customers to find fault with him, he will do his own faultfinding, and if he is sincere and is not imbued with that most hopeless of all industrial diseases called “knowing his own business,” he will find every day for years on end something that can be bettered. His superintendent, who, with an indifferent employer, might continue the use of antiquated machines, will on the contrary be doing a fair second-hand trade in them, and when his old equipment has been replaced with new, he will still not be satisfied. Nay, he will go perhaps to the point where he will have machines in-

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vented and made for him, or will so make them himself in order to meet a certain need. He will not crowd the soul and life out of his workmen, but will recognize that their prosperity and his are bound in one, and that if his product is to be brought low in cost it must be by furnishing them the very best tools and equipment and the most favorable working conditions. Because only when that is done and liberal pay with continuous employment is added to it can one get that self-discipline enforced which is the life of a high-grade modern shop. No watchfulness of foreman or superintendent and no pressure from above can take the place of the willing brain, added to the zealous hand of a happy, well-paid, well-placed, well-equipped, and contented workman. Physical or nervous overstrain is unprofitable in the shop or mill, as well as in the office. So, side by side, with a broad outlook into the world must go a broad outlook into his own shop. Such a manufacturer will look closely and ceaselessly at his rate and quality of product, and at its sure and steady flow. He will watch his wastes and his unproductive expenses, but the last thing that will worry him will be the rate of wage. If his

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goods come out with few or no seconds, if his ratio of repairs and "returns" is small, if his waste of time and materials is kept to a low limit, if his shop is well balanced, if the spirit in his works is that of earnest, steady, quiet enthusiasm, if he is a leader to his men and not a tyrant over them, he will be content if his men earn high wages for his cost sheets will be right. But he must meet the organization of the German and the strength of the Englishman with the keenest study of the quality and the rate of his own production, and he must never be able to say of his own ways, "I am satisfied."

The man with this outlook within and without, whatever his line of product, need not fear to enter the world's competition and given patience he will be successful therein.

These are the great things. But some little things are important, too. We have had too much in America the spirit of the title of this chapter, "What have we got to do with abroad?" and this spirit has led to a comprehensive ignorance of "abroad" which has been a sad handicap. I hesitate to write of our lack of knowledge of common geography, for it is a

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sad and painful subject. It has its tragic-humorous side. One smiles when a Boston house writes to Manila on June eighth and again on June twenty-fifth, saying on the latter date that they have received no answer to theirs of the eighth, and must insist upon an immediate reply. It is a bit droll to have a New York house refer an inquiry from Panama to its agents in the Philippines, but both of these took place.

I must confess to a letter from my own home office not long since covering a statement of a small account, and asking the office in New York to step out and collect it, said account being in Brazil. And I remember asking a clerk where Jamaica was, to be told it was in the Pacific Ocean. If I proceed along this theme my remarks will possibly become more forcible than fragrant, and I will only say that the ignorance of the average American young man and woman as to the world's geography is vast. I have never found, and the inquiry has frequently been made, any school anywhere where they taught geography with thoroughness. It is really quite important to know in what part of the world a would-be customer is. I have seen heating apparatus recom-

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mended for Java. Akin to this is the equally tragic lack of knowledge of foreign languages existing among us. This is epitomized in the old joke: “If the foreigner does not understand English, speak louder.” Our own tongue is so good a language and we speak it so well that to some it almost seems discourteous for a foreigner not to understand it, and we are so accustomed to feet and inches that meters and the like are disagreeable. I have known American manufacturers abroad to realize with something of a shock that intelligent merchants and manufacturers could not always speak or understand English, and that the French and German and Spanish languages were really practical things in the countries where they prevail. It has been with an amused annoyance sometimes that some of my fellow men have had painfully to realize these things to be true. I remember that at the Paris Exposition a large Chicago house had an exhibit. It was near mine, and after the exposition had been open a month or so, the case containing the goods sent by this house was so very much in my way, for it had stood about a fortnight or more in the aisle, that with my own man I opened it and set it up in the show case

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belonging to my Chicago friends. There was a lot of literature with it, all in English, and all in feet and inches and dollars and cents. I have more than a suspicion that the house that treated their goods this way have a profound conviction that expositions are no good. Not far away were the exhibits of some well-known manufacturers in Connecticut which they had put into the hands of a Paris house that had fifty exhibits in charge, and each of them naturally got one-fiftieth of the attention of that house. One day a fine-looking German came and looked over their case intently. He could speak but little English, but after a while came to me and made me understand that he wished to speak to the representative of that exhibit. I managed to tell him that the man came there once a day for a few minutes, and otherwise I knew him not. He went away, and ten days later returned with his bright, intelligent daughter, who spoke English well. She told me her father had sent home to Germany for her that she might talk English to the representative of the American manufacturer, for her father wanted to buy some of the American tools. To my great regret I could not even then find the

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representative of the American exhibitor. The couple departed, and the American lost an order.

The line of least resistance with a foreign buyer is to offer him the goods he wants described in the way he understands them and in the measures and weights with which he is familiar. If a Russian came to St. Louis to sell goods speaking only Russian and with Russian literature, he would not get far, but more than one American manufacturer has tried just this sort of thing. The widespread and growing use of English throughout the commercial world has aided us, but ability to reach a customer in the language and the terms he understands, it is hardly necessary to say, is helpful.

American manufacturers are charged all over the world with certain sins alleged to be almost peculiar to them — underpaid postage, bad packing, substitutions of goods, inattention to correspondence, long and unexplained delays. All these are in the calendar of evils, and with some justification. To these can be added one special business sin that exasperates foreign buyers and has made some drop American lines that they had taken up. I refer to what seems to be our ingrained habit of changing list

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prices and altering discounts without notice.

A foreign buyer takes an interest in a line, puts it in his circulars or catalogues, spends money to sell it, gets it going and sends in an order. He then receives word that since the last catalogue sent him the price is changed and one is now pleased to quote him so and so, less so much. Or he receives his goods together with a letter stating that the order is filled somewhat reluctantly because the price has meanwhile advanced and future lots will carry the new price. Instantly all the expense the foreign buyer has put upon the goods is wasted. His customers feel that he has tricked them, and the American manufacturer is called very hard names, of which "shabby" is one of the least. I recall one concern, and a large one, the head of which personally supervised the detail of making up every price list, for he said those price lists were the heart of his business and they should be made with such thorough care that they never should be changed. They were not changed for fifteen years, and every buyer of that man's goods abroad knows that save for serious cause that list will not be altered. This is true, though in a lesser degree, of dis-

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counts. I have known houses abroad either angered by an increase in price in some such way as I have described, or almost equally annoyed by having a stock of goods on hand, and having the manufacturer send out without notice a revised discount sheet in such manner that his foreign agent was obliged to sell out at a loss.

Many of us make the serious mistake of grouping all foreigners as unsafe people to receive credit and of writing rather curt letters that cash with order or against documents are our sole export terms. It is needless to say that there are houses in almost every large city in the world a debt from whom is a good asset. Cash against documents is preferred by many buyers as well as sellers, but it is a pity to lose valuable orders from strong houses because a provincial habit keeps us from doing what our competitors do. Do you believe in your own goods? Then, within reasonable limits and when conditions permit, why not let a sound house see or even try them before they are asked to pay? A failure to show this confidence or courage (with caution) has cost orders.

On the subject of insufficient postage, I can

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only say that there are houses abroad who so frequently receive underpaid letters from America that they simply reject them. It is hopeless to correct this evil, this trifle which has cost a deal of money to our industries — it is hopeless, I say, to correct it until we give up putting the cheapest office boy we have at sending out the mail in our offices. We pay, perhaps, \$20 per week to have letters typewritten that are dictated by a man who may get several thousands a year, and we often spoil the operation by putting a \$3 a week boy to inclose and mail them.

One day I saw a lot of American goods in the Far East all streaked with rust. The buyer was an American by birth and training, but he had given up buying those goods in the United States. He said that he was paying fifteen per cent. more for English goods, and the reason was that the Englishman packed his goods properly and the American would not. He said "would not" because he had written the American manufacturer pointing out to him that goods going around the Horn and crossing the Pacific should be wrapped in oiled paper or oilcloth to keep them from moisture, and asked that a con-

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shipment be so packed. To this the American manufacturer replied that he knew how to pack his goods and would send them out well cared for in the usual way. These were the goods I saw damaged by streaks of rust, and that was the last order that was sent.

I saw one lot of small oil stoves that had been shipped from America, half of which were broken when they arrived. The buyer had requested special care in the packing with this result. That was also the last order.

In one case a green label was not wanted because the native people did not like that color, but when the order was received in America and the standard label was green, the manufacturer or his storekeeper said things about the foolishness of the natives and shipped the regular goods. In due time they came back with freight charges both ways to follow, and no orders came after that.

A shipment for Santos was sent to Rio, and months of delay ensued and much expense complicated by the fact that the shipper kept all the bills of lading in his own desk.

It would not be fair, however, to give the impression that these were average or typical cases

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among American manufacturers. They are far too numerous and they are an injury to the trade of those who know and do better. An English or German manufacturer can accept a cable order to go by a definite steamer on a fixed future day, for in Europe the railroads coöperate and will take the shipment from the interior to be delivered "for specific sailing." Our railroads will not receive freight on this definite basis, and while, doubtless, they do their best, this uncertainty restricts our industries. We lose steamers now and then and goods lie over sometimes a month. This does not occur abroad. The law will not allow our railroads to accept an export shipment for "specific sailing" and then pay damages if they fail to connect for fear this will be a "rebate." We ought to get rid of this handicap. It is expensive to us in the loss of orders.

Let us now refer briefly to one greater handicap under which American manufacturers suffer.

German and English manufacturers find at their coast line shipping companies eager to facilitate the commerce of those lands. Do we? All the way from Hongkong by way of India to

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New York I saw not one American flag on a ship. One vessel bearing our flag had been in Calcutta within a year. I saw a neat merchant steamer carrying the flag of Sarawak, and three good merchant steamers carrying the flag of Greece, but none of ours. We have all discussed this theme in public heretofore as if it were a matter for our shipbuilders or our shipowners chiefly to consider, or as if our sailors were most in interest, but this is not so. There is no worker in any factory throughout our broad land that is not a sufferer by the absence of our own merchant ships, and we all are daily losers by it. Consider what the position of a city like St. Louis would be if all the railroad lines entering it and every steamboat line upon the river also were not only owned in Chicago, but were deliberately operated in the special and peculiar interest of Chicago and with the purpose of developing the trade of Chicago at the expense of all others. How long, think you, would the business man of St. Louis prosper under that pressure? But this is virtually what we encounter at our water front. Our goods there enter, with rare exceptions, into the hands of shipping lines whose chief interest it is to de-

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velop the commerce of their own nations. They are glad to get, of course, the business flowing from our shores, and in a degree must so far cater to it as not to lose it, but throughout the preference must be given in their connections and in their management to those who are our competitors and who are their compatriots. If it can be realized that all Americans, manufacturers and farmers alike, who seek export trade are constantly handicapped by having to ship their goods through the hands of our commercial antagonists, we shall be more disposed to do something serious to restore our merchant marine. We have talked subsidy and we have talked differential duties, and we have talked free ships, but in this great practical America no men have yet arisen commanding enough to say effectually on this vital theme: Get together. Can not personal and special interest be put aside and the demand for something creative come up from every factory in our land so strongly that we shall all know what the owners and the workers in our mills are coming to know, that they are the real sufferers. Then this handicap upon our industries may cease. We have set off too long one man's

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"kicks" against the other's prejudice, and rather than please or offend some one we have all fallen into the ditch. It is time to get something done.

And now, let us frankly face certain other facts. An attitude that we are able to compete with foreign manufacturers on their own ground while unable to compete with them on our ground can not long be maintained. The day of special privilege is passing away, not to return. The day of self-help, of standing on our own feet, of facing fearlessly the world in open competition with it is dawning. It may not come abruptly; it should not so come, and it may come with certain painful processes in its readjustments. But coming it is, inevitably. And when it comes our readjustments need not be made at the expense of the workers we employ, nor to our loss either, if we are wise and careful. Already men have begun to learn that to reduce wages induces waste, and that such a course is at best a costly and crude process.

We must learn that efficiency means three things that always go together and can not be separated: the increase in our output and its improved quality, the increase in what we pay our

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workers, and because of these the decrease both in the direct and indirect cost of what we make. We are the most efficient people in the world, yet are but beginning to be efficient. We have yet to learn to utilize the brains of our workers as we utilize their hands. The best plants anticipate and avoid waste so far as may be by designing, making, operating, protecting their machinery in accord with the laws of its being. When we treat our men in the same way, using each of them at the work he is fitted to do, training each in mind and hand to use efficiently the best appliances under working conditions that develop his mental and physical manhood, then we shall save human waste and reach a quality and quantity of product that will free us from all doubts of our power to meet on equal terms the men of any land. So long as we look first at the wage rate and the past or present cost instead of at the product rate and the possible cost we shall all be cowards. He who would export must first be fearless, then patient. And when backed by fearless patience, by continued self-criticism and intelligent knowledge and a broad spirit, the most doubtful of us will come to know that American manufacturers are peers of any in the

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world and able if and when they choose to meet them fearlessly in the commercial arena.

There are conditions in our public affairs that seem to call for a word more. The day is passing away when in this land any man or group or corporation can say in effect to any of their fellows, “All that you have is mine if I can get it.” The day is passing when an employer can say to his men, “All you have of brain and body and soul is mine at the least return if I can get it.” Profits are ceasing to be the sole and supreme law; men doubt the righteousness of a high dividend rate from a factory that does not pay an average wage sufficient for a decent living. Men feel that there are limits to the arbitrary buying of labor at the lowest cost that poverty exacts. There are those who say that for a manufacturer to say his costs are high because his labor is inefficient is to condemn himself. These and similar things are in the air.

The moral horizons of commercial life are wider than in the days of our fathers and are still expanding.

Together with this is the cry against the great combinations arising from popular wrath at profits thought to be unrighteously exacted or

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at the unjust destroying of small competitors. Yet we must have large masses of capital in our industries and under strong control, for to produce cheaply we must produce largely. The day of small production has gone, too. But such large grouping of capital must no longer be upon the old basis, but on a new one, which seeks the efficiency of the worker without overstraining him and while rewarding him well. There must come a new spirit which looks more at the man and less at the pay roll, which conserves the man as one of its primary thoughts, which does not regard a shut-down as a reasonable way of handling a great plant that was meant for production. There must be change in our philosophy of labor. We must learn the difference between cheapness and economy. We may think well to crowd our machinery to its limit and scrap it in a few years because a new invention shall have then replaced it; but we must learn not to crowd men that way, for we can not scrap men. The man can grow, the machine can not, and we must be sufficiently scientific in our management to avail ourselves of the *growth of the man*. We must deal with inefficient labor by teaching it and by paying it enough to stimulate it into efficiency. We must not handle workmen as

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overseers would drive slaves, but as leaders would lead men.

These things must come, and in the places where they have arrived there is more to-day of industrial peace and plenty and profit than in the darker corners of our factories. We must find a way to combine the living and expanding wage with the massing of capital and the growing of product, so that the human forces shall work together. Too much of our criticism is merely tearing down. Let us begin to build, and one of the first steps in this rebuilding, for it is no less, of our industrial structure will be to ask ourselves sincerely the question heretofore suggested, “Where are we wrong?” and to answer that question fearlessly, even though it may require our putting aside the prejudice and the practice of the past. When this shall be done, our exports, which, large as they are, are perhaps less than five per cent. of our total commerce, will so expand that, since the markets of the world are steadier than the markets of any one country can be, our factories will run full time, filled with well paid and earnest workers to the profit of their owners and to the public weal.

Our domestic business needs to feel the throb-

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bing pulse of the larger world of foreign commerce. "One must be done, the other not left undone." Stability in home markets depends largely on ability in foreign ones. But the larger life is not entered, the door of opportunity is not passed by "standing pat" any more than it is by joining a club or an export association, good as these are. Fighters in the world's arena must lay aside every weight and the habits of thought and traditions that so easily beset them, and with keen self-training address themselves to the contest. The world is said to grow through its discontent and our trade will grow on our own self-discontent with every present standard and method. The place for narrow men is in ruts; for dead men in graves. The big world calls for big men, large in outlook, broad in view, keen enough to see that economy lies not so much in saving as in wise expenditure.

Industrial education has here in America made great strides during recent years, but there are two kinds of industrial education — that of the hand and brain within the shop; that of the heart and brain within the office. I plead for both, for these two are one. One need not speak

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for any method of management. These are many, of varied and different merit. But for one great, broad, generous, and efficient spirit of management I may fairly plead. One that shall be intolerant of waste of all kinds and to which neglect shall be a sin. One that shall set high standards of efficiency but equally high ones of sympathy. One that shall be large enough to see that with proper equipment and wise direction the well-paid man is the cheapest producer. One that shall slay the spirit of gaining through gouge and shall bring to life the spirit of success through service.

Let us reduce it to details in a series of business proverbs for the manufacturer.

Never give up self-study. There will always be something to learn about your ways. "The goblins will get you if you don't watch out."

Don't let your initiative become sterilized by a tariff or anything else. (This may be as a friend says it is—"grossly inferential," but it is true nevertheless.)

It is not wise to destroy the initiative of your working force by looking so hard at a quarter yourself that you can't see the five-dollar bill beyond.

A justly discontented force can cost you more directly and indirectly than the most expert and costly supervision can ever find out.

The cheapest and best discipline is that which well-paid, hopeful, and zealous workmen naturally create.

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The cutting of piecework rates and wages is the hall-mark of inefficient management.

Obsolete machinery is the foe of profits, the brother of high cost, and the friend of bad methods.

A Bourbon superintendent who can't learn is as bad and no worse than a Bourbon employer who won't learn.

Export trade begins at home, in your own shop, and first with the head of it. To get it bring your wages and output up—your costs and prices down; know what is doing in your own plant and you can smile at a competing world.

When you have good stuff to sell, well and cheaply made, properly designed, and of regular quality, well packed, you will have no trouble to sell it abroad. What one country or market won't take another will. It's a large world. Export trade is not "easy work," but it is a necessary filler. Our shops are built to run, and the money of Argentina will buy bread and cheese in the United States.

When things are dull at home, why shut down and cut off earnings at the root? A large market is better than a little one. The balanced demand of all the earth is steadier than the needs of any one country, however large. There is room in many lands to do what is not now done at all, or to do better what is now ill done.

Finally, we have not sought to deal with details but with essentials, and the most essential thing in our shop is, or ought to be, ourselves. Therefore we have spoken plainly of our own need for self-help—the same thing in our industrial life that we teach our children in our

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private lives. Let us therefore lay down certain laws for ourselves:

A thing is not right because we do it.

A method is not good because we use it.

Equipment is not the best because we own it.

The wisest of us has much to learn.

None of us can afford to be deceived about our own affairs.

It is better by self-criticism to find and correct our own faults than to have our customers do it for us.

It is a sound law of the business world—“To thine own self be true, and it must follow, as the night the day, thou canst not then be false to any man.”

To get by the law of gouge and grasp is not true commerce. Against that law our enlightened business sense protests, and with equal force it protests against the wicked assumption that our business men are in any large part under the control of the law of gouge and grasp.

Commerce is service, the friend of the worker, the servant of the consumer. I venture a protest against the spirit of attack that far too much prevails. Criticism should be a sober process. This is not found in that tyrannous type of mind that involves those who disagree with it in torrents of abuse. All are not wicked at whom mud is thrown, and righteousness is not advanced by evil means. We Ameri-

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cans believe in progress; it is a law of business to do so. But we believe also in moderation and base our hopes for the future on moderate progressiveness and on progressive moderation, in public as well as in business affairs.

CHAPTER IV

COSTS AND THEIR CAUSES

IN the Republican Platform of 1908 appeared the following words:

“In all tariff legislation the true principle of protection is best maintained by the imposition of such duties as will equal the difference between the cost of production at home and abroad, together with a reasonable profit to American industries.”

It is a great pity that those words were printed only in the English language. It is a pity they were not translated into Japanese, that they might adorn the cabs of the seven hundred and twenty American locomotives on the Japanese railways for the benefit of the Japanese engine drivers; nor translated into Chinese, that those in Manchuria who wear American cottons might know how self-sacrificing the makers were in selling them to them. It is a pity they were not translated into Javanese, that the machinery America has sent to the Dutch East Indies might tell to the Malays there how benef-

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icent we have been to them. It is a pity they were not translated into Hindu, that the stokers of the Calcutta electric-light works might know how generous was the American firm that sold them their apparatus.

It is a pity they are not printed in Dutch or German, that customers in Rotterdam and Berlin might know our generosity. It is a sad thing that those words should not be sent widely abroad, that the unselfishness of our American manufacturers to those outside of our own country might be made more clear than it now is; because those men abroad have an idea that the American manufacturers sell them goods because they can afford to do so, and until I saw the language of this platform I had myself always supposed it was quite possible to sell to foreign countries at a reasonable profit.

But since the difference in the cost of production is said to be such that we need protection against the manufacturers abroad, let us look more closely at those words.

Speaking from a manufacturer's standpoint, I venture to think it can be shown that this statement of the Republican platform of 1908 has these definite characteristics:

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First. It involves certain contradictions, well known to manufacturers, which destroy its force.

Second. It assumes the existence of facts that either do not exist or whose existence can not be accurately ascertained or clearly defined.

Third. It may involve, if taken to be true as it reads, such discrimination against some American manufacturers and in favor of some foreign manufacturers as is certainly unjust and would, I believe, be conceded to be improper even by its authors.

Fourth. It ignores the nature of cost and the nature of competition, and, taken at its face, calls for the removal of the duties on many American manufactures.

Fifth. It has worked grave injustice to our poor people and disaster to many American manufacturers.

These things I believe at the end of twenty-five years' manufacturing experience. I have followed attentively our recent tariff discussions, and certain facts in them or the absence of certain facts, have forced themselves upon me. Some of the fundamental things with which all manufacturers are familiar have not been mentioned. I have not heard a word in our Con-

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gress of many of those things about which I should tell a costkeeper to be watchful.

I have not heard it mentioned that there are many elements of cost, not one or two or three, but many and complex elements. And, therefore, because I have found it possible, and because we all know hundreds of American manufacturers have found it possible, to compete in the markets of the world, it is for that reason that I venture to consider at length this important question.

How does it happen, that in a quotation recently made for machinery to a mine in Japan the American price was \$215 less than the English price? How does it happen that American locomotives are running upon the Japanese railways, upon those of Formosa, upon those of Manchuria and Brazil? These are sold in competition with makers in Great Britain. I know what those locomotives cost, relative to those made by German and English manufacturers; and I happen also to know this, which is one of several stories which will illustrate this particular contention — namely, that last year I was in the city of Tokyo, and a friend who was with me took a large contract from the Japanese Imperial

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State Railways, in open competition with Germany and England, for several million dollars' worth of locomotives. That gentleman went to the locomotive shops of the Imperial Railways, and the Japanese master mechanic said to him: "We can make locomotives much cheaper than you can in America."

"Can you?" inquired my friend. "If so, let us get at the facts. If you will tell me from your cost sheets what your locomotives cost, I will tell you what ours cost." And, by the way, he said: "What makes you think your locomotives cost less than ours?"

"Why," the Japanese replied, "because we pay only one-fifth the wages to our men that you pay to yours."

So they got the cost books, and discovered that the labor cost for locomotives on the same specifications was three and one-half times greater in the Japanese shop than in the American shops. That is a perfectly normal fact and not an abnormal one.

I went to the city of Birmingham one day. If it was impossible to sell there the goods I went to sell, I was either ignorant or foolish. However, I went. An English competitor there, be-

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ing very busy on other work, said to me, "Will you take a contract to manufacture a standard line of my goods in quantities and turn them over, delivered in Manchester, so that I can make ten per cent. profit upon them?"

I said, "Certainly." I should have been delighted to have the order. He then put it up to his board of directors, but unfortunately for me, their British pride forbade them to give me the contract.

To illustrate another phase of this question: The city of Liège, in Belgium, has about the lowest priced industrial labor in Europe. It is of course absurd that American manufacturers should attempt to sell goods in Liège, but still they do. I spent the day with a large buyer there, and all the morning we discussed prices, which were satisfactory, and quality, which was satisfactory; and I went back in the afternoon fully expecting to get an order. But the old gentleman then told me the duty on his goods had been raised — for he sold largely in the American market — and he said to me: "Your goods are satisfactory and the prices are right, but I will not give you an order, because you shall not come to me with one hand saying 'Thou shalt

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not enter,' and with the other hand 'Give me your business.'"

A few more illustrations may be interesting: My agent in the city of Calcutta one day called my attention to the shoes he was wearing. He said, "I paid \$3.85 for these shoes."

"Why," I said, "that is an American shoe."

"Yes," he said, "I bought it here. It is the regular American \$5 shoe."

I said, "Are you sure?"

He said, "Yes. I wore them to New York and went into the store on Broadway where they are sold and asked what the price was there, and I was told it was their regular \$5 shoe."

I treasure, as a souvenir, a small, ordinary pencil. It has upon it the name of the American Lead Pencil Co., of New York. I bought it out of stock in the small town of Bandoeng in Central Java. I have in my home some men's toilet articles — shaving soap, and so forth, made in New Jersey. I bought them in Hongkong. I found such goods in stock in drug stores around the planet.

On a main street of the city of Batavia is a good business building. It is one of the most creditable buildings in Java, and over the door

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are these words, "United States Steel Products Co."

Yet we are told that though foreign manufacturers are handicapped by distance, by time, and by freight, we can not compete with them at home because we pay high wages and they pay low wages.

To end for the time these illustrations, let me give a list taken at random from one export journal stating the American goods that they are offering abroad, for sale in open competition with Germany and Great Britain: "Ironmongery, fine tools, bicycles, sporting goods, lamps, razors, firearms, carriage makers' supplies, sanitary goods, lighting systems, dry goods, men's furnishing goods, boots and shoes, corsets, hats and caps, textiles, clothing, women's furnishings, office furniture, office devices, stationery, typewriters, filing cabinets, printers' supplies, paper, machine tools, boilers, lubricants, electrical material, valves, wood-working machinery, belting, shafting, pulleys, packing, furniture, kitchenware and agricultural implements." By that mention of agricultural machinery one is reminded of the significant fact that there are manufacturing houses in America that sell almost no goods in the

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United States. They pay as high wages as anyone. There is one in Poughkeepsie N. Y., making agricultural machinery; another is near Newburgh, N. Y.; one is in New York City. There are many more.

It is often assumed, without argument, that American manufacturers can not compete in the world's market on even terms without protection, and can not even hold their own at home. The only suggested way of meeting competition is by reducing wages, the crudest, the coarsest, and the most brutal of all methods.

The only form of competition that appears to be known is in the prices at which goods are sold, and yet some American goods selling widely abroad bring higher prices in Europe and other foreign markets than goods produced of the same kind in the markets where they are sold.

The necessity therefore exists for a broader view of this whole subject which shall take into account facts that have not yet appeared, which shall consider it from a practical rather than from a theoretical side.

Let us look at the cost of production from the manufacturers' standpoint. What is it and what does it involve and how shall it be handled?

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There are four groups that enter into every factory cost:

1. The cost of labor.
2. The cost of material.
3. Burden cost (or overhead charges).
4. Selling cost.

The aggregate of these four fixes the point per unit of product where profit begins. Let us discuss them separately.

First, labor cost. In a modern industry this is often not the largest element in cost per unit of their product. In some industries it is rarely the largest element in unit cost. In my own experience there have been many cases where, had the labor cost equaled the other elements of cost per unit, I should have thought the superintendent needed overhauling. It is a matter of testimony that in an American locomotive the percentage of direct labor cost is eighteen and that the percentage of material cost and of burden and overhead charges is eighty-two.

It needs only the statement to show that the important factor in labor cost is not the rate of wage, but the *rate of output*. It is not what you pay, but what you get for what you pay that counts.

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Once, when my office was located in Paris, I employed a lot of French carpenters and paid them ten francs a day — \$1.90 each — and at the end of three or four days I was well-nigh crazy. Down the long aisle of the building I saw a familiar-looking tool box, with a saw sticking from the end, and I ran to the place and found a man who looked like an American carpenter.

“Are you a Yankee?” I said, “I want to employ you at once.”

He said, “Boss, I charge \$4.50 a day.”

I said, “Come right along.”

Two days later I discharged four Frenchmen, for my one American carpenter did more work than the four Frenchmen — and I saved money by the process.

There are sound reasons why the American carpenter did as much work as four Frenchmen.

A French workman goes to work having eaten almost nothing. For breakfast he has nothing more than a bit of bread, without butter, and coffee. At eleven o'clock he stops to eat a little bread and drink a little sour wine. That is all I ever saw any of them eat. At three o'clock he stops again to eat a little bread and drink a little sour wine. After he gets

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through at night he has what he calls a dinner. Such a man can not work at any labor requiring steady physical exertion continuously under pressure, in competition with a man who eats three square meals a day.

Once, an Englishman asked me to go into his works and suggest how to cut down his labor cost. What I found at that particular time in that English factory was this: a screw machine was making bolts of various sizes, and a boy was running it at a very small wage, probably about two shillings a day.

I stood looking at the boy and his product; first, twenty half-inch bolts, and then twenty-five one-eighth-inch bolts, and then fifty three-quarter-inch bolts, and then five or six one-inch bolts, and then back to quarter-inch. I went to the superintendent and said to him, "That boy is costing you more than a man who earns \$3 a day would in one of our shops. His time is used in altering tools. He is 'breaking up,' as we say, altering his machine from time to time and stopping his processes ten to fifteen times a day."

He said, "What would you do?"

I said, "Give him one size and let him run

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all day on that. The next morning give him another size and let him run all day on that, and the next morning give him another size; do not stop your machines, but run them steadily on one size."

"Why," he said, "we can not get foremen to think that out."

As has just been stated in the matter of labor cost the serious element is not the rate of wage, but the rate of output. One of the things that should be burned into the reader's thought is this — the essentially variable quality of cost. It cannot be talked about as a fixed thing. Cost is everywhere and always variable — at every time and in every place.

Output varies with the character of the workmen, the equipment, its arrangement, or other local conditions, with the nature of the superintendence, with the discipline, and so forth. It is absurd to assume that work done by a man paid \$4 daily costs more per unit than work done by a man paid \$2 daily. It may be more or less costly, and depends upon other conditions. Therefore, because certain goods are produced at a certain labor cost per unit when the wage rate is \$3 per day in a certain place, it can never

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be argued that the same wage rate on similar goods results in a like labor cost per unit in another place. It may vary from ten to fifty per cent. To discuss the wage rate as the controlling factor in labor cost per unit is both inadequate and misleading. The railroads are a notable example of this. The English railways have vastly cheaper labor than we, but their freight charge per ton-mile is two and one-half times ours. With pride the Indian railway department told this last winter that, though their labor is one-eighth of ours in cost per day, they had succeeded in getting down to a trifle lower freight cost per ton-mile than we. They had been years at it, with a labor rate one-eighth of ours, and had just succeeded.

I have recently received a letter from the representative of my business in Rangoon, saying, "Figure on an apparatus using native labor cheap but bad." To say a man gets \$3 per day means nothing at all as to the cost of his product. It may be either low or high, and the wage rate taken by itself alone affords no basis of comparison. Apart from the wage rate, labor cost per unit is very largely under the control of the manufacturer and may be radically al-

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tered without changing the wage rate at all.

This question as to a manufacturer's control of his labor cost apart from the wage rate may be illustrated by examples.

I know a factory in which the product was doubled in two years without adding a man or without adding a machine. And this is the way it was done: it is a very interesting experience in labor cost. The men had been paid on day work. The labor men have, and they properly have, a horror of piecework, as it is commonly administered, because, I am sorry to say, manufacturers have so abused the piecework principle that the laboring men have justly come to fear it. As piecework is handled in many factories it ought to be hated, as it is hated, but in this particular factory the head of the concern had the idea that he could save by guaranteeing his men a high wage. He became convinced that he could save by paying a high wage, and he said to the workmen, "We will guarantee your day rates; you shall always earn your present day's pay. We will also guarantee that your piecework rates shall not be cut. We will agree with one another that obvious mistakes will be corrected either way, but if you earn large pay, un-

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derstand, your piecework rate shall not be cut."

That was true. That factory has operated upon that basis for many years. The wages of some men went up to \$6, and in some cases even to \$7 a day. I had the pleasure of selling some of the product of this shop abroad, against European competition.

Now, when the men were guaranteed an unlimited earning rate, see what happened. The manufacturer said, "There is the machine. There is your power. Go ahead. Earn all you can, and God bless you." Now, naturally the first result of that was largely to increase the product. Then three other things happened. The manufacturer went to a man and said, "Pat, you are earning pretty good wages. It does not make any difference to me what you earn. The more you earn the better for us both. But there is one thing you can not afford, and that is to have your machine shut down for repairs. It hurts me, and it hurts you every hour that that machine is idle, and your machine is of that particular kind and is engaged in that particular work that knocks it to pieces if proper care is not taken. Every hour it is delayed in operation hurts both you and me."

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Says Pat, "What is it that you want?"

"I want you to spend about fifteen minutes before work starts every morning in overhauling that machine in your own interest. Do not let it get into such shape that it will need repairs."

I can not state the exact number of thousands of dollars per annum that was saved in that factory in that simple way, but it was several times \$10,000 a year, just that item of examining carefully the machines every morning before beginning regular operations.

In the next place, the system of using fuel had been more or less thoughtless in this shop. The manufacturer went to his workmen and said to them, "Boys, you are not going to be cut, no matter what you earn. You can not afford to waste time in firing improperly. You must be careful." His men did as instructed. At the end of three or four weeks about an hour and a quarter's time was saved each day, amounting to one-eighth of the operating time of that part of the plant, besides a saving of fuel.

In many factories the element of defective goods is a large element of cost. This manufacturer went to his men and said, "Boys, you are well paid. There is no limit, practically, to

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what you can earn. But it is not fair on that basis to make any bad goods." The men thought the matter over among themselves, and finally they came to him and said "What is it you want?" and he said, "I want you to replace the bad goods in your own time and to pay for the material that you waste." And right there was saved several thousand dollars more in the course of a year.

In those ways, without touching the rate of wage, the output of that factory was doubled in two years; and the same thing, to a greater or less degree, depending upon different circumstances, is possible everywhere. But some one will say about the case quoted that there must have been lax management theretofore. That was not the case. Prior to these events that concern was successfully competing with many others, and held a leading place.

I met an American leather manufacturer while abroad. Some English visitors came into his plant, and he showed them how he was making a hundred dozen of a certain kind of skin per day — that is, doing a certain operation on that many per day — and they said to him: "That is very good, indeed; better than we do, and we are

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very much pleased with it." But he did not tell them that he had just bought a machine that did three hundred dozen a day. And when a few years later he went to see them in Great Britain and found they had risen to his standard of one hundred dozen a day, he did not tell them then that he had put in another machine that did six hundred dozen a day.

Labor cost per unit varies with time and place, and in the same shop is constantly changing. It is unlike in each of several mills producing the same goods, belonging to the same company. A superintendent who would take three mills making the same goods, under the same ownership, in three different cities, and get the cost alike would be a wonder. I have in mind two factories, belonging to the same concern, where for two years it has been a constant effort to get the costs alike in making the same goods. But what is to be done when in one factory power costs three times as much as it does in the other?

Labor cost is affected by sanitary and climatic conditions. It varies with the quantity and the quality of the output, and it can never be assumed that it is at the close of the year what it

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was at the beginning of the year in the same shop. It is enormously modified by the progress of invention. The labor cost in a shop in January may be in some respects entirely wiped out by July. The labor cost in July may be entirely altered by December; else what is the purchasing agent for, and for what purpose are the manufacturers feeling out all over the world for the latest machinery? Base a tax upon the January cost, that is just equal to the difference in foreign cost, if there be such a thing, and it is altogether altered by July, and by December it may be three times the difference. And every manufacturer knows these things and lives up to them every day, but does not always talk about them in public.

Labor cost varies with the arrangement of machinery within the shop. It is affected by the space available. It varies with changes in material, with the sufficiency and the regularity of the supply of material and its suitability to the work. And the labor cost of Monday when the stock runs out Monday afternoon and new stock comes in Tuesday, is not the same on Tuesday that it was on Monday. The steel mill may have made an error and the labor cost go flying

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up for the time. And I write from an experience in figuring labor costs to hundredths of a cent per unit.

Labor cost is affected by the lighting and the power equipment of the shop, and will change with the going of one superintendent and the coming of another. These things need only be said one after the other to have their entire reasonableness made plain to all.

Labor cost will alter radically within a month, by the introduction of new tools, new machinery, or the change of a process, even to the extent of having a whole process eliminated. It varies with the wastefulness of material used in producing an article, excessive use of supplies, the loss of time and material occasioned in making defective goods; and every one of these items has to be carefully watched by any alert manufacturer.

The labor cost is affected by methods of paying (by piecework on a righteous basis, and by day's work on an unrighteous basis) and by a just and considerate application of the methods of paying apart from the amount paid.

Labor cost is, therefore, a variable element. It can not be measured by any fixed standard.

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To offer a fixed rate of duty to cover the difference in labor cost is to state an absurdity, for the one is variable and the other is fixed.

But labor cost in any factory is both direct and indirect, as will be made plain; upon the proper adjustment of one to the other depends in a degree the labor cost.

Reaffirming, therefore, that in many industries the unit cost of labor is not the largest element of the total unit cost, but may be a small percentage thereof, we pass to consider the cost of material. This is the most fixed of all the elements of cost, but only a little thought is needed to show that this, too, is variable. In two shops, one buying in large quantities and the other small quantities of the same goods, the price of the material will vary. In two large shops which buy the same quantity, but have buyers of different skill and differing in amount of free capital with which to purchase, the cost will vary. In two shops in the same business, but located differently with respect to transportation, the cost will vary. Within the shops the cost of material will vary with the handling facilities provided and with the space available for storage. The cost of material will vary with

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the system of receiving the same and storing them. The cost of material must always include such important and variable items as freight, cartage, wharfage, demurrage, and the like.

The cost of material must always include the wages of the storekeeper and a share of rental for the space occupied by it. The cost of material will vary also with such depreciation as will take place if it is not protected against loss. This, therefore, though relatively a fixed quantity, is variable, so that in different shops, in the same line of business, it can not be argued that the net material cost in one even approximates that in another.

The cost of material must include the factory supplies, the purchase, keeping, and management of which is an important and complex element of cost where thousands may easily go out of sight. Consider what it may mean to have one purchase of bad lubricating oil. Its use on valuable and delicate machinery may cause the loss of thousands of dollars in a week.

But when the variable items of unit cost of labor and material are combined, what is known as prime cost, or actual outlay only has been ob-

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tained, and two serious elements in cost, each of which sometimes amounts to a larger total than either labor or material, and sometimes exceeds both, are still to be considered.

These are discussed in the next chapter.

CHAPTER V

COSTS AND THEIR CAUSES. (*Continued*)

WE take up, third, burden cost or the overhead charge. This is often ignored or not appreciated at its true value. Probably more concerns are wrecked by failure to estimate or manage it properly than by any other single cause save perhaps insufficient capital.

Among the items covered in burden cost are such as these: taxes and assessments, repairs to buildings and machinery, indirect labor, superintendence, experiments, insurance and fire protection (two different things), depreciation, bad debts, accidents, interest and discounts, power, heat, and light, and legal expenses — every one of them matters needing the most careful attention, if they are to be kept within reasonable limits.

A large concern located on expensive land in a city with high rates of assessment and taxes may bear a burden in this single respect enough to pay a profit on the entire investment of a

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small concern more favorably placed; but, as showing the complex nature of this problem, the same concern may, by reason of its equipment and its efficient organization, produce goods, so cheaply as to overcome this handicap though paying the same or higher wages.

Repairs vary with the character of the buildings, their age, their location, with climate, and with respect to machinery, with the care given to it, and the nature of the work done by it. In some industries this item of repairs is very large.

Indirect labor is an unfortunate necessity in every industry. A cotton mill employs carpenters and steam fitters, whose presence is necessary, but whose expense is a burden on the output. Every modern shop has to have a tool room. This question of indirect cost is often a very serious one, and is a matter requiring the closest professional study.

The cost of superintendence is apt to be heavy in proportion as the labor is cheap. I was much interested in a visit to the jute mills in Calcutta where I talked with the superintendent. It is an excellent plan, if you wish to get at the details of a factory, to talk with

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the practical men who operate it. I asked this gentleman about his labor. He said it was cheap, very cheap.

I said, "Is it wasteful?"

He answered, "Extremely wasteful."

I asked him in what other respect it was bad, and he said it was bad in the respect that it required an unusual amount of European superintendence — three to four times as much as they would give in Scotland.

Experiments looking toward new or better output, tools, or machines are a very expensive item in many factories. It is hardly necessary to say that insurance varies. An old wooden mill must charge the cost of its output with many times the unit cost for insurance that is borne by goods produced in modern so-called slow-burning buildings. The actual loss from fires, over and above that covered by insurance, is a part of the burden cost frequently forgotten and of uncertain amount, but often serious. Depreciation is a large item of cost, amounting often to as much as ten per cent. per annum of the entire value of the machinery, buildings, and other equipment, varying with conditions. Sometimes neglected by manufacturers, it forms

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a burden of a self-enforcing character, which, if not reckoned as an annual addition to the burden cost, will come in a lump sum whenever machinery or buildings must be replaced. The loss arising through machinery thrown out of date by new inventions is a serious part of burden cost frequently forgotten. The loss arising from the continued use of antiquated and slow-producing apparatus is another large part of burden cost.

Some few years ago I visited a large English engineering shop, and to my horror discovered an old-fashioned single cylinder walking-beam engine being built. I asked what that was for, and they said it was for a cotton mill in Oldham. Alongside of that they were building several modern triple-expansion engines. I said to the proprietor, "Why is that old type being built; it is fifty years behind the times."

He said, "Simply because the owner said his father had one like it, and he wanted the same thing."

This question of slow-producing apparatus is sometimes by itself alone very serious. There was one large sugar refinery in New York City which closed on that account alone. I recall an-

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other where the single item of cartage was so great they had to go out of business. Three woolen mills stood idle for years because their machinery was out of date and they would not replace it, and another was idle and stood idle because it was three miles from a railroad and the cartage killed it. Those are the things that make for high cost rather than the difference in the wage rate. The losses from accident are a constant terror to every manufacturer, and yet I stood, recently, in a factory claiming high protection from the tariff law which could not only have made a profit by saving in handling charges alone, but which stood to lose — for lack of care for human flesh and blood, and because of failure to properly protect its machinery — thousands of dollars every year.

The loss arising from bad accounts is present in every business, and varies with the care in selling goods.

The burden charge arising from interest and discounts varies with the amount of free capital available in the business. I do not refer to the interest upon bonds or the interest on the total investment, with which some concerns charge themselves as an expense, but rather the

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interest that is to be paid upon real-estate mortgages and upon money borrowed to supply working capital and for discounts allowed customers for prepayment.

Power, heat, and light vary greatly. The source of power is so variable that no general statement can be made—for example, power from water, from steam, from electricity, or from gas engines. I am interested in two concerns using electric power. One pays five cents per kilowatt hour, taking it from steam; the other one and a half cents a kilowatt hour, taking it from water, a difference of over three hundred per cent. in the power rate.

It will be seen that the item of burden cost is one of importance and difficult to define. It is one in which every manufacturer is very closely interested, because it very often affects the cost of his production far more than the rate of wages that he pays. Manufacturers, however, are very apt to assume the burden cost to be less than it is. Instead of making a careful study of it, they take what seems to be the obvious course, reducing the pay roll, instead of the more economical course of studying closely their burden charges. Once my partner said to me,

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“Although your department of this business is not the factory, I want you to go into it every day for an hour or two, simply to find what is wrong.” And for ten years I never went a day that I did not find something that could be bettered. Before a manufacturer can claim the right to have this whole people taxed for his benefit, he should show affirmatively that his methods are the best that are known.

When a tariff bill was pending, some years ago, a representative of a crucible-steel works in Pittsburg came into my office and said, “I have a petition I would like to have you sign.”

I said, “What is it?”

He replied, “It is a petition to have the duty upon our product advanced.” He went on to say in answer to my question as to why they wanted this additional duty: “We have got to keep the standard of American living; we have got to hold up the American rate of wages and see that our American working people live on a basis far better than the pauper labor of Europe.”

I said, “That is very interesting. How much of the proposed increase do you expect to add to your pay roll?” He said they had not yet given

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that serious consideration. I asked him if he would add any portion of this increased duty to the pay roll, and he replied that they had not come to that yet.

I said to him, "I have already signed a petition to have our duty reduced, but if you will enter into an agreement with me here and now that within a year after the duty is increased you will add *any* percentage to your pay roll, then I will recall my petition and sign yours and publish the facts."

He said, "You could not expect me to do that."

I said, "Now, Mr. So-and-so, you are paying ten per cent., are you not?" He said he was. I then asked him if his desire was not simply to pay a little better than ten per cent. He said, "Well, you know how these things go."

The reduction of wage rate is always an expensive process, involving serious, unseen, but real losses.

Who shall calculate the difference in labor cost in a large factory between the output of a force of, say, a thousand mechanics, well paid, well equipped, well housed, with ample light and power, with machinery well arranged, with ma-

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terial exactly suited to their purposes, with management that wins the loyalty and enthusiasm of the men by liberal pay and just treatment; and the output of an equal force of men working in poor light, with variable, insufficient power, poor equipment, with wages cut to the smallest limit, with improper sanitary conditions, and harsh treatment?

The difference between the output under above conditions may be the difference between ruin and dividends. You can not confine human nature within the limits of a wage rate. Wholly outside of the rate of pay there is unlimited scope for brains in manufacturing.

But in all this we have merely produced our goods and laid them at the factory door. They are not yet sold, and before their sale takes place another serious element of cost must be added. Therefore we must discuss selling expense. This selling expense is sometimes as large as the entire cost of labor, material, and burden.

One need only to mention what it has cost to sell automobiles in order to get an immediate assent to that. Selling cost includes such items as traveling expenses, commissions, advertising in many forms, office salaries and rental, post-

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age and stationery, packing and shipping expense, office equipment, office heat and light, and similar items. These show at once that they are of a very variable character. In some lines the cost of advertising alone is equal to the combined cost of all things else put together. In some industries traveling expenses are a very heavy item. Office expenses are very high in other industries, and in others office expenses might well be greater if they would so insure the ascertainment and reduction of burden cost. Some time ago, in answer to the question, "Do you keep your costs accurately?" a manufacturer claiming to need protection told me:

"I carry them in my head. I have been thinking for some time of putting in a cost-keeping system. It would cost about \$4,000 to install the system, and I have not yet seen my way clear to it."

I said to him, "Do you know whether that room or this room or the other room pays you a profit or costs you a loss?"

He said, "No."

I said, "How can you economize if you can not tell that? How can you know where to economize?"

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In one concern well known to me the burden and selling costs were double that of material and labor, and labor was least of all. Misleading and inaccurate statements frequently arise from lack of accurate accounting and cost keeping. Manufacturers are frequently ignorant of their own costs. There was one so ignorant of his own business that he had \$400,000 stolen from him, and did not know it. Manufacturers have been often seeking the cheap rather than the economical. Cost is often assumed to be in labor where it is actually consumed in burden, or valuable by-products are neglected that would carry the burden cost in whole or in part.

From the above I think it will be obvious that no assumption can ever be made that in order to reduce cost, wages need be touched. On the contrary, the field for saving outside of wages, and for the economical use of the funds spent in wages, is so large as to tax the powers of the human mind.

There are four whole classes of cost, each comprising numerous important items, that should be studied carefully before the question of reducing wages is so much as considered.

I am going to take up presently three things

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not mentioned before, hidden reserves, compounded duties, and double incomes. They are rather obscure, but extremely interesting things, and we are led to think of them by the fact that I have not yet mentioned the serious element in cost called officers' salaries. Did you ever hear the proposition laid down that if the pay roll was cut the officers' salaries should be cut in proportion? And is it not perfectly sound that since the margin of living is narrower for the workman, the man who has the broader margin should be cut first and most? It would seem to be obvious.

I have touched but lightly upon the abuse of the piecework system, but I know one factory where the rate was cut five times lest the men earn too much.

Since it is clear that cost is a large and complex subject, of which the item of labor forms but one, and often a minor, part, and that cost is fluctuating and variable, it follows that no tax can be laid which will in different places and at different times always cover the difference in cost between foreign and domestic producers.

There is no such fixed difference in cost be-

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tween foreign and domestic producers. There is not, and there never can be, such a thing as fixity of cost.

The difference between three domestic concerns in labor cost may be as great, or even greater, than the difference between foreign and domestic concerns in the same line. The attempt to adjust a tariff rate to cover such a difference is therefore absurd. If it provides for the difference in the cost of foreign goods and of American goods made in an American factory where those goods are expensively made, it would provide an enormous bonus for an American manufacturer who made his goods economically. If it provides for the difference between foreign cost and American cost for goods made in the most efficient American mill, it will not protect at all the American maker whose cost is high. You may have an injustice done one American manufacturer or an enormous profit paid to another, and you can not avoid it. It is in the nature of things. No law can get at it. And if your proposed duty provides for the average foreign cost—an impossible thing to learn—it does not provide, therefore, for the skilful and economical exceptions among for-

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eign manufacturers who could still compete.

How shall anybody ever learn the exact foreign costs of articles? Has any American manufacturer in our public discussions ever brought before us the actual cost sheets of his factory in full detail? They are the core and kernel of the manufacturer's business. He would not dare to produce them publicly lest his competitor find them out, but were they so produced this little theory and contention about the difference in cost between goods at home and abroad would oftentimes be found to be in favor of the United States manufacturer.

There exists, therefore, in the difference of cost no possible basis for a tariff tax. Many general statements have been made by American manufacturers respecting the disastrous effects of lower duties on their business, but it is not what the manufacturer says he can do, but what he does do and what with proper management and equipment he is capable of doing that is the controlling factor.

How many American manufacturers are willing to have their methods of production and cost accounts openly analyzed to show whether or not they could produce goods cheaper than a

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foreign competitor? There is no reason for taxing the whole American people because manufacturers are either lacking in scientific study of their own business or unwilling to let the facts come out.

The talk of the rate of wages as fixing the cost of production ought to end as being hopelessly ignorant and unscientific.

The following may be safely affirmed: First, the rate of wages is not always, perhaps not usually, the controlling element in cost; second, competition is not always, sometimes not at all, a matter of selling price; it is often a matter of quality, often a matter of design, and often a matter of suitability; third, the cost of production is more influenced by rate of output and its quality than by rate of wage or hours of labor.

About twelve years ago the head of a concern in Brooklyn decided that he would put his factory on a nine-hour-a-day basis. He became satisfied that there was an element in the ten-hour day that was real, but difficult to see, namely, the "tired" hour. He became satisfied that the tenth hour was the "tired" hour — that at that time the point was reached under which a

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man could not work to the highest advantage. He put his factory on the nine-hour-a-day basis, and kept a very careful record of his cost. The wages remained the same. At the end of the year he was four per cent. to the good; he made an absolutely larger product.

I presume most people are aware of the experiment that took place in great shipbuilding yards in Scotland, where as a result of conferences between owners and their workmen, it was agreed that they would try the eight-hour day for a year, at the end of which time if the results showed no disadvantage to earnings in the eight-hour day it would be retained, otherwise the men agreed to go back to the nine-hour day. As a result, at the end of the year they retained the eight-hour day, because it paid. I do not mean to argue from this that you could go with an ax and cut everything arbitrarily to eight hours, but that the proper and reasonable adjustment of things to that will some day obtain is unquestioned.

Given the scientific spirit in management, constant and careful study of operations and details of cost — and this is the crux of the whole question — *given the scientific spirit in man-*

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agement, constant and careful study of operations and details of cost, modern buildings and equipment, proper arrangement of plant and proper material, ample power, space, and light, a high wage rate means inevitably a low labor cost per unit of product and the minimum of labor cost.

I have seen laborers driving piles in Japan. Twenty women, each with a rope, lifted the pile. They were paid twenty cents a day in our money. I called the attention of a friend whose business was making pile drivers in New York to it, and we figured the cost of the piles. They cost four times as much to drive as it cost in New York. I was in a brickyard in Singapore, where I calculated the product of the men. Their rate of pay was thirty-five cents a day in our money. I happened to have in my pocket a very accurate cost statement of a brickmaking company in one of our eastern cities, signed by its president, and when the superintendent of the Singapore yard and I figured his labor cost together they were precisely the same. These principles have stood the test, in practice, of two panics and of a single year when we lost thirty-five per cent. of all our business at one stroke, be-

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cause the industry that gave it to us collapsed. New business had to be found from some other place. Yet no man's wages were cut.

A steadily decreasing labor cost per unit of product is not inconsistent with, but on the contrary is normal to, a coincident advance in the rate of pay for the work when accompanied by careful study of methods and equipment, as previously suggested. Conversely, low-priced labor nearly always is costly per unit produced, and usually is inconsistent with good tools, equipment, and large and fine product, else such labor would not be low-priced.

But, someone will be sure to ask, are not foreign manufacturers as well placed as American manufacturers, save in the single exception of wages? That question must be faced. To ask it, however, is to answer it in the minds of all familiar with the details of the facts. The answer can only be in the negative. It is rarely claimed that foreign labor is as efficient as American labor and never where American labor is permitted to do its best. A letter from the head of a great Japanese cotton mill says there are in his mill from three to four times the number of employees for the same number of looms

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that there are in an American manufactory.

I visited a rubber factory in Singapore where the superintendent, a Frenchman, told me it took five Malays to do one Frenchman's work. In an English shop I saw five men pushing a truck to move, say, four hundred pounds, for which they were paid \$1.25 each, or \$6.25 total, and an American manufacturer who was with me shrugged his shoulders when he saw it and said he would have a small crane and a man at \$3.50 a day to run it. It is not claimed that the European mechanic is of as high morale and quality as the American, and this may be illustrated by two remarkable stories, one of which, at least, is typical.

In a large factory in England, in which I spent ten days, there was one young man who seemed very industrious. I said to his employer, "Why do not you raise his pay; I think he is worth it."

He said, "I can not."

I said, "Can not; what do you mean?"

"Well," he said, "he will not let me raise his pay. That man earns two pounds a week — \$10. I have offered him ten shillings extra, and each time he lays off just enough to make

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the two pounds weekly which he desires."

The point I want to make clear is that this is typical, and that if you are running a factory in Manchester, Birmingham, Leeds, Glasgow, Oldham, you would have to deal with some men whose pay you can not raise. They will not accept it; they do not want more pay. You find there a condition we know nothing about here.

Now, secondly. A large European manufacturer said to me, "What allowance do you make in your factory for loss of time from drink?"

I said, "None."

"Oh," he said, "do be serious."

I said, "I am perfectly serious."

"Well," he said, "I know your workmen drink."

I said, "They do; but no self-respecting American mechanic will work at the bench permanently alongside a drunkard." Now, that is true of our American mechanics. The first-class mechanics in this country will not keep in a shop the man who is habitually a drunkard; they will freeze him out. In fact, the superintendent would not have him in the place.

I am told and my general observation confirms it, that there is a regular loss in Birming-

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ham of about four per cent., in Manchester of about eight per cent., and in Glasgow of about twelve per cent. of the total time of the factories on account of absence from over-Sunday drinking, and that in Glasgow they do not expect to get a full shop until Wednesday morning. I believe this is a thing against which the English master struggles without success, namely, a force of men often sodden with drink, with which we do not have to deal in this country at all.

European concerns are eagerly seeking American equipment and studying American methods. Concerns in Berlin, Paris and many other places, are equipped with American machinery. They send men over here constantly to study our American cost of production. Rarely is the rate of output abroad equal to that in America. My French competitor told me they could not do such work as we did. Nowhere else is the problem of saving labor cost so closely studied as it is here. Labor-saving machinery is an American specialty and product, and the concerns in Europe that manufacture with the best labor-saving machinery are those that have taken their inspiration from studying here.

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I have known the heads of great European concerns who kept their sons in the United States year after year studying our methods of production. Nowhere is the cost of transportation so low as it is in America; nowhere are such facilities offered for transit as in America; nowhere is the discipline in a factory so close, so sharp, and so keen, as in an American shop; and in proportion to the pay of the men being high, that discipline becomes voluntary. Rarely abroad do sanitary conditions equal those in America, and nowhere do living conditions equal those in America. Nowhere is there a more efficient type of men, who are therefore better producers, but the standard of living is fixed by the man and not by the pay roll. It is not dependent upon his wage, but upon the relation between his income and his outgo. Merely to pay a man \$5 a day does not create a standard of living. That depends on the man himself. In India men wear upon their shoulder a sign which says they are peons—"Peon No. 1," and so on. Peonage is a crime in this country, and the difference between the two represents the standard, not of pay alone, but of manhood. It is admitted that some elements of burden cost

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more in other countries. Compare the taxes; compare the question of military service, which interrupts no American laborer, but does seriously interrupt the operation of shops abroad. It is admitted that the problems of burden and selling cost are nowhere so closely studied as here; and, finally, the whole question of scientific methods of management, now so common, is American, and the only men who teach it are Americans.

From the above sketch it is affirmed, without fear of successful contradiction, that American production to-day is often as cheap as or cheaper in the labor cost per unit than foreign, and, so far from needing protection, it needs to be set free, that we may conquer the world.

But why do not American manufacturers always sell as cheaply as foreigners? Sometimes, they privately say, because the law permits high prices and they, of course, sell in the highest available markets.

Did you ever think of what the hidden reserve in a factory is or may be? You may never see it in the books nor know it by the statements. A statement may be made that may seem perfectly clear and yet not show

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the facts. There was a concern that was profiting largely. It was not thought desirable that, for purposes of taxation, the profits should appear. So they discovered that their real estate was not so valuable as it had been before, and they marked \$100,000 off the valuation of it. At the end of another year or two, during which they had done well, they found that their real estate had depreciated further, and they marked another \$100,000 off the value of it. There was a hidden reserve of \$200,000 which no statement showed. And yet that statement would be filed as an accurate statement of fact. There are many cases of that or of a similar kind.

It is interesting to consider the righteousness in a manufacturing concern of officers drawing a large income as officers and also drawing another income as stockholders. Is it just that they should ask that we tax our fellow men in their behalf when certain men in that concern are drawing a large salary as officers and large dividends also as stockholders? And whatever the facts may be, is it not but right and fair that they should be clearly known when they come and ask for taxation in their behalf?

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Consider what compounded duties amount to when you buy something from a retailer. Some one comes to the manufacturer for an estimate of cost. The original maker reckons what the actual cost of the material in that thing is to him. That includes the amount by which the price is enhanced by the duty. He forgets the duty. He takes the total cost to him and adds his percentage of profit, and it goes to the wholesale dealer. The secondary manufacturer, perhaps, goes to the wholesale dealer and buys from him. The wholesaler takes the total cost, which includes the duty plus the original percentage of profit, and he adds to that total his percentage of profit and thus compounds the duty. He so sells it to the secondary manufacturer, who, in turn, sells it to his customer, another wholesaler, perhaps, and again the duty is compounded.

The wholesaler sells it to a retailer, and again it is compounded, and by the time the retailer sells it that duty has been compounded, in extreme cases, perhaps four times. It can not be prevented. So long as the duty forms part of the original cost it must be compounded over and over again. You can not escape it.

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I believe that protection is an injury to American manufacturers by limiting their scope and by narrowing their horizons. I believe it costs them enormously in the loss of foreign business, and that is one reason why manufacturers in this country are so rapidly ceasing to be protectionists. But one other reason why the manufacturers of this country are abandoning the protectionist faith is that their plants have been stimulated to become so large that only in rare years has the demand in this country become enough to take their total product, and they have to sell it abroad.

And so long as they must pay the high price for materials they find it is sometimes difficult to sell abroad, although such is the efficiency and therefore the cheapness of their labor in this country, as compared with that of Europe, that it does oftentimes enable them to sell their goods in foreign markets.

Consider the position of a manufacturer whose raw material is, as it always must be, the product of another industry, who finds his home market restricted or oversupplied, and turns, as he must needs turn, abroad for a market. He is handicapped by compounded duties on his raw

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material in a market where, by reason of the law, prices are often high. Nothing but the keenest application of brains to equipment and to output, coupled with the exceptional efficiency of his workmen, permits him to secure the needed outlet.

An overstocked domestic market is often no theory, but a real condition. Take away the shackles that bind the manufacturer, and when these conditions occur he will be free to sell in the world's markets, without touching his pay roll.

Protection, however, causes a manufacturer almost inevitably to depend on the Government for help, instead of carefully and minutely studying the details of his own business. The manufacturer should be his own severest critic and should never be satisfied with his results. *Protection, however, has enabled many American manufacturers to prosper by selling to their fellow countrymen at prices so high that they have not thought it necessary to study their own business closely, because they depend upon Government backing.*

Two men went out of a meeting of one of the committees of the House of Representatives, on

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the Capitol steps, at the time a tariff bill was pending some years ago; as they did so one put his hand on the other's back, "And now," he said, "if we can not make money we never can." Such stories as these are the commonplaces of manufacturers' offices.

Now, however, that scientific manufacturing as a profession has begun and is growing, the fact is found that we can and often do produce as cheaply here as abroad, not in spite of, but because of, the higher rates of wages here, which are but a partial measurement of the higher efficiency and character of the American workman and of the fine equipment put at his disposal.

CHAPTER VI

HALF WAY ON THE INDUSTRIAL ROAD

NOT long ago the superintendent of a southern cotton mill said to his employer, "I cut down our labor cost last month."

"Did you reduce the wages?" he was asked.

"No, I raised them but I got more done."

During the progress of a railway construction contract in Virginia, the negro laborers were paid more than was usual in such work and care was given to providing them with the right tools at the right time and they were well fed and housed. Not only did the contractor find discipline easy to enforce but his work went faster than he had expected and cost less.

In one of our great industrial cities are two well known firms making similar goods. The head of the trade union which has many of its members employed in one of these factories, said recently, "A man never leaves that shop save for old age or death. It's a square place to work. They treat their men well and never

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have any trouble." The other concern has had serious difficulties with its help during recent years and has been at times shut down because of strikes.

Calling one day at the office of a large iron works, I found a fine office building abounding in light and air and in facilities for rapid and easy working. Passing thence into the shop I noted amid grime and dirt that the lavatories for the men were such as would disgrace the worst old city tenement.

We have moved far on the industrial road since the days of Arkwright and of Watt. Almost every step along the way has been contested; now the resistance of the worker has been active and again the resistance of the employer. Yet the advance, so far as it has gone, has been mutual but it has been at the cost of mutual strife and with sad waste of money, of effort and of life. None of us anywhere would go back to the old conditions. There is far less of pain and of poverty than there was. The humblest has a larger outlook and a broader opportunity than many of the well-to-do had a century and a half ago.

Certain things are well established — such as

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the use of machinery and its constant development. America holds its place as the greatest of manufacturing nations because of the peculiar aptitude of our people for inventing and using mechanical devices. We all know now that the use of mechanisms in production reduces cost, saves effort, improves quality, and that the men who run machines receive a higher wage for shorter hours and less exertion than did the old hand-workers making the same goods, and that their product sells at a lower price. In thousands of factories to-day study is continually given to mechanical improvement and the old is rejected and the new adopted with bewildering speed by men and managers alike. The publicity departments of great industries are kept busy promoting the sale of new products and withdrawing those that are superseded. The patent offices of this and other lands are full of devices whereby mechanic arts are made to serve men in novel ways.

Certain work in one of our Eastern machine-shops had always required finishing by hand. What was really the lesser part of the product cost more than the larger part of it because of the hand work, a condition with which no good

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mechanic is content. A bright young machinist watched this day by day for weeks and at last prepared a device which at a stroke removed the hard hand labor and did the finishing work by power. Such cases occur daily.

It will hardly be questioned then that modern industries represent a great advance over the working and producing conditions from which they have sprung. We have struggled upward many long years and have raised ourselves far. But just as little will it be questioned that there is need for a greater advance. "The cry of the children" is no longer heard from English mines but it comes clearly from among the home workers in many a city tenement. Little fingers are still cramped and growing lives still dwarfed by working long hours in bad surroundings for a petty wage unwillingly paid by exacting or ignorant employers. Profit is being wrung out of the struggle of whole families for scanty self-support. Labor receives indeed in some places a fair response to its righteous demands for a living wage and reasonable working hours, and yet we all know that "an eye for an eye and a tooth for a tooth" is still the law under which many workers labor. The out-

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look of employers is still narrow and the consciences of many of them are dull. Within a very short time I have heard a manager tell a slight boy he was employing that his hours were from "eight to eight every day."

Let us stand before a great factory and think of those who are interested in it. At the office door enters the man in control. Often he is not the owner but one among many owners chosen to act for the others. In a true sense he is a trustee for those whose money made the mill. Upon its success his livelihood and their profits depend. Among these owners often are women and children. Their capital is at risk and is largely locked up in buildings, machinery and material. The proportion of their assets that is liquid is small. The demand for dividends is imperative. The risk is large. The man who runs that mill and by his skill, wisdom and experience provides employment for workers and profit for owners, should be well paid; the owners, because their property is tied up in assets which are subject to a serious business risk, are entitled to a reasonable return based upon the actual conditions of their industry. They cannot, if they will, turn their property quickly into

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cash and it is subject to constant depreciation in value. Money invested in such an enterprise as a textile or paper mill should earn more, therefore, than if it were funded in prime securities quickly convertible. It is natural that those whose money is in such industries should shrink from any sudden change in business conditions.

At the large mill gate enters the throng of workers. What they use in that mill is not their own. They, in a sense, are also trustees in the use of tools, material and machinery belonging to others. Their own property is not at risk but their living is. So far as livelihood is concerned, the mill worker has at stake what the mill manager and the mill owner has at stake. Upon the faithful doing of the daily task by the mill worker depends the owner's profit. Upon the wisdom and strength of the management, the homes, the comfort, the health, perhaps the lives of the workers may depend. The mill is the common ground where owner, manager and worker meet. It should be the servant of them all; often it is the master of one or all. As the money of the owners is at risk in the mill so is the salary of the manager,

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and so are the homes of the workers, but the margin of safety for those homes and families is less for the workers than for the manager or for the owners. We expect sensible owners to permit the manager to work under such conditions that he can do his best. It is right that both owners and manager should provide for the workers the conditions under which they also can do their best. As the business risk of the owners must have consideration, so the home risk of the workers is entitled to care.

Outside the mill and often distant from it is the third and greater party in interest—the public—the people who buy the goods that are made there. Out through the mill gate go cars of goods to this public, and these consumers of the mill's product are interested in the design, the quality, the cheapness of those goods, and in the promptness and regularity with which they are supplied. The right of the consumer to standard goods at a reasonable price is just as real as the right of the owner to a reasonable profit.

In Soerabaya, Java, I saw dredging and filling done in a strange way. Naked men with small baskets dived from boats in midstream, scraping

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the sandy mud from the bottom into these baskets, from which they loaded the boats. These then were rowed ashore and again with hand baskets the mud was dumped upon the marshy spot where the building was to be erected. When a suction dredge is substituted for such a crude process all parties gain — the owner of the dredge, the workers on the dredge, and the customer for the dredge. The owner receives more profit, the worker is paid more wages, and the cost is less.

Whether they will or not, these three parties in interest in the mill of which we have spoken can not be separated. They are united by bands not less strong that they are unseen, nor less potent that at times one or another of these parties seek to break or ignore them. A mill will not permanently prosper if the owner seeks his profit at the expense of the worker, whether it be the expense of the worker's pocket or health or brains, nor will it long prosper if the owners seek profits without regard to the consumer, nor will the worker or consumer profit long if the goods are sold more cheaply than they can be made. Loss to the mill owner means, ultimately, loss to the mill worker and loss to the

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consumer, too. Nor will the worker long profit if, thinking of himself alone, he demands an undue share, more than can justly be had, of what that mill produces. These three must get along together. How can it best be done?

Above all financial considerations rises the human interest in our theme for we deal with the homes and lives of men. If into dark places, light may come; if for penury, plenty may be had; if for sickness, we may have health; if for anxiety, we may substitute peace, surely it is worth doing. Not, indeed, that we may do these things all at once, but we may open the way so that as time passes the clearer light of a better day may dawn. Can we translate the laws of industrial production into terms of human happiness? No less than this is what must some day be done and is what we seek to begin to do.

A recent book says: "What workmen want from their employers beyond anything else is high wages, and what employers want from their workmen most of all is a low labor cost of manufacture. These two conditions are not opposed to one another, as would appear at first glance. On the contrary, they can be made to go to-

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gether in all classes of work without exception." The writer adds that he speaks "with the object of advocating high wages and low labor cost as the foundation of the best management."

A prominent manufacturer says: "The American manufacturer to be successful must be an economist, know exact costs, and have the courage to abandon slipshod ways of product."

Another manufacturer says: "When the times comes, and I think its approach is near, that as much thought and study and as big brains are devoted to the problem of labor as have heretofore been devoted to and absorbed by the problems of financing, selling, and equipment, when we study the man behind the machine as closely as we do the machine, we shall see ways of making the one fit the other more closely than we do now."

All about great mills are instruments regulating machinery; means are provided that machines shall not be overstrained, that their product shall be within their power regularly to produce without damage to the machine; we even care lest machines get overheated and, in a true sense, lest they get overtired. We know that a tired machine gives out and its life is

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neither so long as it should be, nor its product so large nor so good as it ought to be. We protect it against dust, we lubricate it, we even let it rest, yet that machine is dead, inert. When shall we learn that to be most productive a living, responsive man needs also not to be overstrained, that he needs rest, that his product must for economy's sake be always within and not beyond his powers? Until the course we take with our machinery is recognized as of equal application to our men and women workers we shall not have solved the problem of production. So long as we extract from men and women the most possible for the least return to them, we are working against the deepest laws of nature and of finance; our sight is short; we are but blind leaders of the blind. The normal resistance of a working force to pressure under conditions of a narrow wage and long hours is not an element that leads to continued profit. And here, once for all, let it be said that no management is scientific or permanently profitable which either promotes or permits human overstrain, or which taxes the future of women and children.

In the city of Worcester is a mill employing

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fifteen hundred girls. It stands in pleasant grounds made attractive to the eye by well kept lawns and shrubbery. Entering, one finds that the promise of the exterior is fulfilled within. The offices are light, spacious and equipped with modern appliances. So is the factory itself. It is a joy to one who appreciates the money value of good living conditions and a happy working force to look along the great sewing rooms. Here is modern industry at its best. On all sides is light falling through spacious windows. The room is sufficiently high to avoid any sense of cramped space. All is white and clean. There are neither shafting, belts nor pulleys. The air is fresh and free from dust. One looks down the long lines of electrically driven sewing machines and sees hundreds of neat-looking girls, most of them in white shirt-waists, sitting quietly but busily at piecework, talking now and then with one another, but wasting neither time nor energy. Among them move the quietly dressed forewomen, not so much watchful for the sake of discipline, for such a force in such circumstances needs little of that, but acting as instructresses, counseling here, aiding yonder, helping the less experienced, now and then cau-

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tioning those who would overdo. Small wonder that of this mill it should have been recently written: "One notices that all the employees — even the very youngest girls — show unusual intelligence, and the thought automatically suggests itself that this must be an unusually desirable place in which to work, a place workers would seek, a place which would not need to hunt for help when needed. On inquiry, we learn that there is usually a 'waiting list' of applicants for work in the factory, and these the most desirable workers in a city of nearly 150,000 inhabitants."

Women in that mill earn from nine to fifteen dollars a week. The products of their hands are sold in fifty different countries. On the large table in the center of the office is a silver loving cup — a gift to their employer, in which every one of the mill workers took part, on the occasion of the fiftieth anniversary of his connection with the business. When I congratulated him upon the broad and skilful management of his plant, he said that they were conducting there an enterprise which they regarded as a social experiment and which they were happy to find lucrative.

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As a manufacturer myself it has been my experience that the concerns with whom it was easiest to compete were those who had stopped half way on the industrial road. They gave due thought, indeed, to machinery, buildings and to general equipment. They were careful about their materials and kept in touch with the more obvious of modern methods of accounting and management, but the greatest force in their industry — the responsive power of their men to leadership, they left untouched. They paid the usual rate of wage or had a fixed rate of pay for a certain job. They allowed their men to earn a certain sum weekly at piece-work and when more was earned they cut the piece work rate. They lacked adjustment to the human element or close co-operation with it. But when among competitors was one who had traveled farther along the industrial way — had gone so far that he could see the power of the human force, could get it working with him and responsive to him, then that concern was dangerous to its rivals. Its product would come out of better quality or at lower cost or with fewer seconds or with less delay, or with all of these things, and it was difficult to meet

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that competition. The shop where the employer and the employee are one force, pulling together, is the most serious of competitors.

During the hard time of 1893, the head of a large manufacturing concern in the central West sat sorely troubled in his office. Through the long afternoon he had gone carefully over his business statements, endeavoring to adjust himself to the adverse winds that were blowing. For orders that had been pending he had purchased largely only to have the orders canceled when he could not recall his purchases. Loans that were needed to tide over stringent conditions could not be had. Banks not only declined further accommodation but were calling for payment. It was next to impossible to collect funds due him. As the day closed he could see no clear way out of his troubles, and when the factory whistle blew he closed his books with a sad heart. There was a knock at the door; opening it he found a committee from his workmen who said the men wanted to see him in the factory yard. He and his men had been friends through many years and it was the thought of what might happen to them that was now one of his serious troubles. He could not believe

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they meant to make demands upon him at this crisis. He went with the committee to the steps where he could see the men, waiting with their dinner pails to go home, and then one of the committee said to him something like this: "Colonel, we know times are hard and orders scarce. We hear that money is pretty hard to get, and we just want to say that a lot of us have worked here with you for many years and we have saved some money. It is in the savings bank, and we are here to tell you that it is at your disposal, if it will help you through this squeeze." And the strong man bowed to tears, scarcely able to speak his thanks, went back to his office glad in the thought that the greatest thing in his industrial life had come to him, and ready for any sacrifice and effort.

I should greatly fear to be the competitor of a house in which such a spirit existed, unless the same spirit were behind me also.

There will be those who will say that the incident just given is hardly credible amid the bursts of discontent we all hear, and yet it is a short time since I was telling this same story to a friend who said that in Florida he knew an employer toward whom on the part of his

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workmen the same regard existed. One day, something having been said about hard times or shortness of funds, two of his Italian employees came to him with money which they had saved and offered it to him for his use. I shall never forget that during the panic of 1907, when things were worst, I was voluntarily tendered a loan by one of my own trusted employees.

Some of our manufacturers, ignorant of the mighty power that a happy working force may bring to their support, seem to seek to crush it as if they did not want that help. It was during the noon hour in a large New England machine shop, and I was going through the plant with the proprietor. The building was new, the equipment fine and well arranged, and all on the physical side was of the best. The one o'clock whistle blew. An instant later we passed a young mechanic sitting at his bench whom I could see was just finishing reading a paragraph in the newspaper he held in his hand. With loud and abusive language his employer attacked him — "Here, don't you know any better than to be reading newspapers after the whistle blows," and more. It was hard to stand by and say nothing, perhaps by silence letting the

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young man think I sympathized with such behavior towards him. I have not forgotten the quiet look the workman gave his employer while silently he put down his paper and took up his tools. The employer had some remarks to make as we went on about how hard it was to get on with labor.

One must not seem unaware of the "soldier" in industry, for doubtless "soldiering" exists. It was vividly described before me by one of the leading advocates of so-called "scientific management" when I was a member of a Congressional Committee inquiring into that subject. There can be no doubt that cases exist where output has been and is deliberately limited by workmen. On the other hand the attitude of my friends, who are mechanics, toward the man who does not do a fair day's work is rather intolerant. They do not want him on the next vise. One wonders about certain things connected with "soldiering." It is often more comfortable to do a steady day's work than it is to loaf, and sometimes when the speed of machines is fixed it takes quite a little effort and thought to "soldier." Can it be that "soldiering" is the reaction against "speeding"? To what ex-

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tent is it the quiet resistance of intelligent men to what they regard as imposition? If this is in any degree true, and to the extent to which it is so, is it not evidence that both the parties to the "speeding" and the "soldiering" have traveled but half way on the industrial path and have yet to learn to pull together?

The spirit of the officer at the head of an army filters down throughout the rank and file, and if that spirit is one of strong leadership, we all recognize that what we call a fine morale is thereby infused into the entire force. The power which beat the Austrian, despite his numbers, at the battle of Leuthen, had its origin in the spirit of the talks the night before between Frederick the Great and his rough Pomeranian grenadiers around their campfires. Leadership is as great a power in industry as in war or politics. In war it leads men meagerly paid to endure cheerfully privations and sufferings, wounds and death. It supplies a spirit far beyond the bounds of military discipline and it upsets kingdoms and wins empires. A strong, just and kindly man at the head of a great industry is felt by all the workers down to the humblest servant in the plant, and they will

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serve him with unselfish devotion when once they have absorbed his spirit. Public discussion is full of complaints of labor against capital and of employer against employee. There are wars and rumors of wars, and as we look upon the surface of things the industrial sea seems all in storm. Meanwhile, in a thousand mills move quiet, strong currents of industrial activity where men work with men side by side amid cheerful, happy and improving associations. We have, it is true, gone as yet but half way, but we are still on the march and the confusion and the tumult are but the noise of those who would, upon the one hand, arrest that march and, upon the other, accelerate it.

CHAPTER VII

THE RISE IN HUMAN VALUES

IF in imagination we try to visualize the history of the human factor in industry, the far background of the picture will be filled with those masses of Oriental toilers through whose painful labor by crude methods the Pyramids and Baalbec were created. Nearer we shall see the slaves of Roman days, the serfs and villeins of the Middle Ages, the turbulent artisans of the dawn of modern industry, the strenuous toilers under the early factory system, and in the very foreground the skilled mechanics of to-day. The movement up from slavery to free labor has covered centuries and its latest fruit has ripened within the memories of living men. Looked at from the human side alone, it is a far cry from the bricks made without straw and equally without pay, in ancient Egypt to the voluntary, well-rewarded service under healthful conditions in our best modern industries.

Yet to-day in some lands the freedom of labor

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is more apparent than real. During the winter of 1911 there came on board a steamer running from Java ports to Singapore, a group of fifty or more men on their way to work under contract as laborers in the plantations of Sumatra. They were the lowest class of black coolies, free from clothing save a breech-cloth, each carrying all his worldly goods in a small hand-parcel. They were quartered on the lower deck where they spread out thin cloths and made shift to sleep and eat. I stood one evening looking down through the hatch at the mass of naked, shining black bodies that lay close together in the crowded space beneath, and with thoughtful spirit recalled the laborers of my own land. The picture of one of these came clearly before me then. He was an humble worker whose simple duty it was to sweep a factory yard. He took pride in that modest task and the yard was kept clean. So also was his little flat in the old tenement overlooking the yard, where his thrifty wife made a bright, sweet home for her industrious husband. There a daughter grew to fine young womanhood. Her father used to speak of her with pride, and both her parents toiled and saved that she might rise. She was sent to

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the grammar school, then to the high school, and at last, with great joy, to the normal college, for the cleaner of the factory yard was ambitious for his child, and his life was enlarged in providing for her beyond all he had ever had himself.

The difference between the Javanese coolies who seemed stupidly content in the steamer's hold, and the laborer in America unselfishly striving that his children might advance, represents a marvelous increase in human values. Was it, one wonders, because some sense of his misery came over him that one of these coolies plunged overboard to death? Or had he left behind in Java something that to him was home? Into the sea he went just off the port of Batavia, and reckless of sharks or drowning, struck out for the land. The vessel stopped, lowered a boat and made careful search for him. For a time his head was seen — a black bobbing spot on the water, then it was gone. The boat came back in silence, was hooked to the davits and drawn to its place and the ship went on. Some said a junk near had picked him up, but this was the expression of a hope rather than a belief. His days of toil under the burning heat of the trop-

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ical sun and all his misery were over.

Great as has been the development from savage and from slave labor, it would be sad to feel that the rise of human values had stopped. It may be comforting to compare the lot of the average workman in America with that of the toiling masses of ancient Egypt or of the Oriental coolies, but a careful look about us will tend to disturb our complacency. With all our boasted progress we still waste human life at a fearful rate.

A battle in which fifty thousand men were slaughtered would shock the world, yet there will die in America within the next calendar year at least five hundred thousand whose deaths are needless, and they will pass out of life almost without public notice. A Titanic disaster fills us with horror, but more lives than were lost on that ill-fated ship perish every day in America from preventable diseases. It is of official record that human beings fairly capitalized as working power are worth in this country at least three times the total of our other capital, and that, conservatively estimated, the needless waste of human life and strength costs us a thousand millions yearly. We are beginning,

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however, to understand these things and to deal with them. Some time we shall treat tuberculosis in a sensible way, as a costly waste which we cannot afford, and shall handle it in practical economic fashion. Prof. Irving Fisher has pointed out, that by spending, say two hundred thousand dollars in treating tuberculosis patients, we may save human values actually worth two millions, or invest our capital in human lives at a financial return to the state of ten to one.

But if our estimate is just, we shall not be content with saving wasted lives, but shall find it of primary importance to stop the awful loss from preventable sickness. If we may argue from English statistics, it seems probable that about three million people in the United States are seriously ill at all times and we are told that half of this can be avoided. The number who are slightly ill, sick enough to reduce their efficiency but not enough so to give up their work, is probably larger, and the presence of such men and women in our mills is a real drain upon our industries. Time your machines never so carefully, a half-sick operative will not get the best results from them. Indiges-

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tion or a severe cold or a bad headache does not allow him who endures it to do the full work of a well person. Everyone knows also that he cannot work efficiently when eyes or brain or hand are fatigued. The factory in which the average of health is high, has at the same wage rate an advantage in labor cost over similar plants in which health conditions are poor, because of the greater and better product of well men. Goods cost more which are made by tired hands. For these reasons the management which has for years given care to machinery, materials and methods begins now to give thought to men, not merely as to their skill or wages, but as to their physical fitness to earn their wages to the full. Preventive medicine has a definite place in keeping the product of our industries up to the mark. Yet while we maintain repair shops to look after machines, there are few industries that definitely maintain an organized department either to keep its men in repair or to prevent their falling into disrepair. True, a practical difficulty which is a result of human liberty comes in here. No employer can make his men so behave outside of working hours as to keep themselves in health. Nevertheless, it

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still remains "up to him" to prevent their being over-strained nervously or physically during the hours of toil, and influence within the shop for healthful conditions and instruction there given in hygiene react upon the men in their homes. He, who appreciates the value of cleanliness in the place where he works, will not be content with a dirty dwelling. If a father learns the value of thorough ventilation in the shop, his children will in this respect be better off.

The present trend towards saving effort and keeping the human mechanism in our factories in good working order does not arise from altruistic motives but from economic ones. In actual practice in a mill it makes a difference in the financial results whether among a thousand men one hundred or three hundred or more are out of health. Any large amount of impaired vigor among his operatives is a condition whose continuance an intelligent manufacturer should know that he cannot afford. Still less can he afford to permit conditions to prevail in his works that cause ill health, for that injures all parties to industry. It pushes costs up, it pulls wages down; it enhances prices by diminishing both quality and quantity of output. Yet a re-

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cent letter from a business friend draws attention to the fact that in many of our factories thousands of dollars are annually lost through unsanitary surroundings or poor lights.

In a shop in one of our Middle States there were several deaths among the workmen within a short period. An officer of a trade union who was visting the plant, said to the proprietor that his operatives ought not to work with a gas-jet always burning close beside each man; that windows should be cut in a blank wall near and light and air be let in. The employer was at first indignant at the suggestion that he was in any way permitting conditions which caused ill health among his men, but in time took the advice — cut the windows, saved the cost of the work in gas by the added light, saved also his men's health and increased the output.

We often care for minor things and ignore larger ones. We put time clocks in our factories to record the coming and going of our men and we note whether they are a few minutes early or late, and this is well. But we are often thoughtless of the more important question — whether when they get there, they are in fit condition to do their work, and some of us are

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careless whether the factory is so ordered that they can work at their best after they come. Sometimes operations which can be carried on without injury are from mere thoughtlessness so done as to be injurious. In a large New England mill two machines doing the same work were arranged opposite one another and the boy tending them stood between. It was necessary for him to turn half way around quite rapidly in feeding the machines. Examination showed that he was making sudden turns of his body twenty-two hundred and fifty times a day. A physician who examined the case advised that the effect of this sudden and continuous turning might be very injurious — that it would certainly injure some boys and was likely to injure any boy.

Between the employer who allows conditions to prevail in his factory which diminish the physical powers of his workmen and the employee who is habitually a little late there is not much to choose. Neither is free of fault, but the employer loses the more for the conditions he permits to exist affect a larger number. It is odd that we assume without thinking that a day's work for a man is a definite

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thing and that one hundred machinists or carpenters of similar experience and training are so much alike that we may properly expect from one that which another can do. We quite forget the differences in health and vigor of these men or the effects of the environment in which they live. If one of them enters the works scantily fed or having eaten ill-cooked food, he can hardly work with the same energy as the man whose wife has provided him with a good breakfast. There was an old Jewish proverb which ran — “If Israel would repent for but one day the millennium would immediately come.” If all the workmen in America were for a single month healthy and strong, were well fed, were working under sanitary conditions with good tools and light, without false motions, with proper materials, the result in the quantity and quality of their product and in its low cost would be a revelation.

We take great care of race horses because success depends on their health and their ability to endure strain. In the race of modern commerce the same is true of men and the interests at stake are such as make it vital that the human factor in our industries shall be fit. Some far-sighted

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employers, having seen that it is profitable so to do, have led the way in caring for their operatives and the contagion of their example is spreading. What is called "scientific management" aims to save waste of human effort in unnecessary motions. It is quite as important to save the loss to workers and employers arising from needless weakening of physical powers by causes which we know how to avoid.

Nothing has been said about accidents for it is widely known how costly these are to all concerned. But in this phase of our industrial life, much yet remains to be done to save both loss and pain and there is ample room for searching thought. In a Western factory two stamping presses stood side by side. On one there were no accidents — on the other accidents were rather frequent, yet the latter had the brighter light of the two. Indeed the sun shone directly upon this particular machine. A specialist was employed to find out why the machine which had the better light was that on which there were more accidents. After careful inquiry he said, "Do not let the sunlight shine upon that machine." They screened the machine from the light and the accidents ceased. The specialist

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reasoned that in certain well-known experiments in hypnotism attention was concentrated upon bright revolving mirrors which in time fascinated the observer and produced a degree of hypnotic effect. He thought that the bright pieces of tin passing rapidly and continuously under the eye of the operator at the machine on which the sun shone directly caused an effect not unlike that of the revolving mirrors,— or, in substance, that the eye of the workman followed so intently the rapid flashing movement of the bright tin pieces in the sun as to make him forgetful at moments of the necessity for care with his machine, and hence the accidents which, as has been said, ceased when the light was changed.

Not merely in health alone are we coming to a right sense of human values. It is well to provide healthful working conditions for the workmen we have, but it is quite as important to make good workmen out of the boys that are growing up. The mechanic with a sound body and skilled hands will be worth much more to himself and others if he has also a trained mind. The appreciation in our thought of the value of men is leading us naturally to deal with them as

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things of worth, and we are beginning to try not only to prolong their lives, but to make life better worth living. As we are grasping the fact of loss from preventable diseases, so we are coming to know the loss from the lack of vocational training. In a groping way we have a sense of the vast waste from unskilled effort. Every superintendent managing skilled labor knows how hard it is to get a sufficient number of competent workers. The demand for what are called first class men exists in almost every factory and the supply is far from sufficient. This results in loss to the half-trained workman who is paid less than he would receive, if he were more skilled; in loss to the employer who does not get as good results from the cheaper workman as would come from the more highly trained and better paid man, and in loss to the consumer also who always suffers when any economic process is inefficient.

We are no longer satisfied with half-trained physicians. Engineers have to pass examinations for licenses, but manufacturers throughout the land have to be content with untaught men for there exists no sufficient means of teaching. If the young men in our country in large numbers

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sought instruction in manufacturing arts it would be found that there are not places in which they could all be taught. Our costly system of education is but little directed toward training boys and girls to do well some particular kind of work. Young men in our machine shops learn the machinists' trade by picking up what they can in actual work at the bench or on a machine — making mistakes and learning by them, copying the methods of older men, finding now and then a mechanic who will teach them something, thus gradually gaining a sort of education by attrition. Ask mechanics of, say twenty years' experience, if they want their sons to pick up their trade in any such haphazard way as their fathers were obliged to use, and you will find that such men appreciate to the full the value of real vocational training. Many a shop foreman will tell you that it will be a happy day for him when he ceases to be a kindergartner and can look through his department seeing every place filled with men who do their work in the best way. We are running many industries now in which the workmen are acquiring shop-knowledge at poverty pay with a burden upon employer and superintendent that

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forms no normal part of the cost of operating the works.

Let us look further briefly at this subject called vocational education to see what it means to the family, the factory and the public. It does not mean what is called manual training or teaching a little facility in some sort of work to a boy or girl. It is much more thorough than that. Many of our boys at fourteen are coming toward the point where self-support will soon be necessary, but they do not know what to do nor have they been fitted to do anything. The world to them is a good deal of a haphazard chance. There seems no special place for them in it. They do not know how to use either brains or hands to help themselves. They eagerly enter a school which offers them a year of preparatory study, looking toward their taking a man's place in the industrial world; which follows that year by another in which they work half the time for wages in a regular factory and continue to study the other half of the time in school, with an opportunity for vacation work at pay if they wish it; and crowns this with a third year similarly divided but advanced; and at last turns them out mechanics trained in some

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definite industrial work, knowing the why and wherefore of it and equipped to take a man's place in the battle of life. The boy's parents gladly see their son thus trained because he becomes an earner even while his education still progresses, and when his training is done is far better able to care for himself or for them than he would be without it. The boy thus equipped in mind and hand is a better citizen, a more productive industrial element, and a stronger man.

Within the factory walls the boys thus taught work almost a revolution. No more does the foreman spend his time teaching the incompetent. No more is he forced to put up with a so-called "handy man" to do a mechanic's job. His force becomes one that not only knows, but knows why it knows. This force earns more pay but the wastes are less and the cost is less, since the output is greater or better or both.

If the result of true vocational training were no more than has been said, it would often bring peace in the family and pleasantness in the factory, but because whatever promotes the efficiency of the man and saves waste in the mill is reflected in the cost of goods, the public also

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profits. To give a thorough vocational training to its young people is a sound financial investment on the part of the nation or state. Its normal outcome is a direct attack upon waste and upon high cost; it makes a saving in the expense of supervision, brings an advance in wages and in productiveness, causes a decrease in the relative burden charge upon each unit of industrial product, and finally and best of all creates a broader manhood, a better citizenship and enlarged opportunities. Such an investment in human values is certain to bring prosperity in its train.

Even without the gain that is accruing from improving health and better training among our industrial workers, very much can be done by treating the present human values in our industries at their real worth. There is a manufacturing company, now a prosperous leader in its field, that once had its "day of small things" when it had to struggle for its place in the world. It was then owned by two partners, both actively at work. The senior was in those early days content with plain brick walls and cheap second hand furniture in the office. His associate used to joke with him, claiming to

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have a more expensive outfit because the junior partner's desk cost seven dollars and the other's but six. There were no rugs or carpets. Most of the clerical work was done by the two partners. But the senior had a keen sense of the value of men and all through those narrow years he paid good wages to the workmen in his shop. He used to say that nothing was so fundamental as a righteous wage, that upon such a wage almost anything could be built with good management, and that without such a wage nothing, however good the management, could be constructed that would stay. Years have since passed. Wealth has come. It is no longer necessary to use second hand furniture or to have bare brick walls, but the spirit of the senior partner is still alive and the righteous wage still prevails. Upon it a great industry has been built with much fine welfare work, and now men bring their sons into the factory to labor with them and seek for them the opportunities for advancement that there exist.

Not long ago I had the pleasure of taking ex-President Roosevelt to this factory that he might see how such ideals work out in practice. He talked freely with a number of the workmen.

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Most of those with whom he spoke had been there many years, some of them since the house began business. At last he met a man whom we will call Mack because that was not his name. "Mr. Mack," said Mr. Roosevelt, "how long have you been here?"

"Ever since I was a boy, sir," was the reply.

"How much did you get when you began?"

"Five dollars a week, sir."

"How much do you get now?"

"Fifty dollars a week, sir."

"Did you say fifteen?"

"No, sir, I said fifty."

This man had through long years of faithful service so earned promotion that at the time when this incident took place he was foreman of a large department, making a fine example of the possibilities open to an American workman under management which estimates human beings at their true worth.

If we look back to the beginnings of things we see that the rise in human values has been great and that it is progressive. It is still going on. It is a plant of slow, strong growth having its roots deep in human nature and in economic truth. It does not advance by leaps and bounds

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nor shoot up like a weed in a night. It is not the gift of one man to another but is a righteous evolution out of the very heart of things. It cannot be dragged upward with a rush as the result of administrative acts or political policy but must advance with steady and stately step with the increasing comprehension of economic science and the keener appreciation of the true relation between man and man.

CHAPTER VIII

THE SCIENTIFIC SPIRIT IN MANAGEMENT

NOT long ago, I stood with a factory manager of thirty years' experience in the shop of which he has charge. It was a prosperous shop. Evidences of intelligent work were on every hand. But the manager was not content. He had spent years studying his own works and had made changes here and filled in weak spots there. His costs were going down and his output going up, but he was not satisfied. He took me about to show that this machine must make way for one better suited to the present work, that these must be shifted to give space for free movement, and that the heavy machinery must be moved to save handling materials.

Here a new place was made for "laying out"; here tools brought nearer to the point of use; here a new machine or fixture was being tried; here a better design of output was being made. Everywhere his searching eyes looked to see what could be bettered. He was under no illu-

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sions. No false pride in his own works blinded him.

He was not controlled by what others were doing, nor following traditions. His keen professional mind was at work probing his own weaknesses. The owners and customers of that factory are in safe hands.

As one looks at our industries, a curious inequality of standards appears. Much of the work is on a really scientific basis. The application of mechanical, electrical, metallurgical and kindred sciences has been general. A science of costs is growing up and is developing a literature. The art of testing materials and of adapting them to special uses is widely applied. The science of accounting is well established. But there is not yet a science of management.

And yet, if a science ever were needed, meaning definite principles based on exact knowledge of facts, it is in this very matter.

There is no uniformity in principles of management, even in the same industry and relatively little has been done to develop standard practice. It is not proposed, nor is it desirable, to diminish the initiative of factory managers,

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but as the study of mechanical science has helped, not hindered the individuality of the mechanic, so a manager would be aided rather than restrained, were the broad principles of a science of managing so made clear as to find general acceptance.

The scientific spirit is always that which seeks to learn all the facts on any one subject and when they are found strives to formulate laws based on the facts and to put these laws into operation. It is a mark of the truly scientific spirit that it is impatient with those who assume a truth from a part only of the facts; or who initiate practice without that thorough comprehension of the laws of the subject which can only be had when all the facts are known and their relations determined. The advocates of what is now popularly called "Scientific Management" assert that they aim to learn the truth concerning factory production in all its varied phases and to base upon such study a practical system of standard industrial operation.

To this end they inquire into the smallest details of shop operation and try to lay down principles of general application. The value of this

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newcomer among the sciences, if it be such, must be justly weighed in forming a sound judgment about it. It will not do to pick out a particular phase here and there and without relating it to the whole of which it forms a part, criticize it as if it stood alone. Nor is it fair to carp at some statement of its advocates as if it, separated from its context, could be treated as alone and complete. What is called "scientific management" has met with attacks of this kind which serve, however, chiefly to show that all the facts concerning it may not have been known, or if known may, in part at least, have been misunderstood.

Disclaiming attachment to any particular system or exponent of efficiency, the following elements may be said to be clear in all that is proposed in behalf of the alleged new industrial gospel:

Close coöperation and sympathy between the management and the workmen. This is foremost and basic. If it is not realized that this is foremost and basic, the subject is completely misapprehended.

The standardization of equipment and accessories throughout the shop.

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The systematizing of work in operation, of the care, maintenance and issue of materials and tools, and the careful routing of all orders while passing through the works.

The planning in advance of the work for each machine and furnishing tools, fixtures and materials ready to the hand of the workman before needed, so that delays between operations are cut out.

The study of the actual time occupied by each element or movement of every operation, in order to determine the correct time required for it and to save waste energy.

The determination in time study of the proper allowance for rest, necessary delays or interruptions of work.

The fixing of standard time for doing work, based upon the aforesaid studies, and the careful personal instruction of workmen in the best and easiest methods of working.

The payment usually to the workman of a bonus or premium, based upon his doing the work in a certain relation to the standard time. It is said to be common to arrange for an increased pay of from thirty-five to fifty per cent. based upon a saving of time.

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The above analysis is not, and is not meant to be, exact. It is a general statement in popular language of the broad facts. Any system must be flexible, must provide for the local conditions existing in each shop, and must suit itself to them. The spirit of the whole thing is coöperation. Where this is absent, there is not present what is called "scientific management." All the blanks and forms and rules in the world will not make good the want of the spirit of mutual helpfulness, which is fundamental. On the other hand, where the spirit of sympathy and coöperation is active in a shop, there "scientific management" is present in its essential form, even if the rules and methods for the present go little further.

It may be said, and truly, that in the suggested principles there is little or nothing new. This is admitted by the advocates of the new methods. But the grouping of these into a whole, with definite relations and establishing them all on a basis of mutual good will, is still so new as to be unfamiliar even to many progressive men, and is still outside the knowledge of some critics.

It is my conviction that it is contrary to the very spirit of efficiency to establish any sys-

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tem of the kind by fiat upon an unwilling or even upon an uninformed working force. One improvement takes place, let us say, in a stock-room, then a change in routing is made; a shift of machines follows, and so on. In a large works it may take, indeed should take, several years at least to get it all in operation, even if in its entirety it is ever used alike in any two establishments. Probably the result will be that progressive managers will adopt features here and there from the various systems, will fit them to the methods already used and let the whole thing develop normally.

This is the proper and sensible way. The chief thing is to get the spirit of mutual confidence and support in full control, and then it is not so very material what form the movements to follow take.

But one thing, by common consent, must be speedily done. The waste of time, materials and effort in our shops must be stopped. The friction arising between employers and workmen, often from trivial causes and misunderstandings, must be done away.

Whatever, in a spirit of candid helpfulness, tends to this and to advance wages and increase

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product under just and equitable conditions should and will have a fair trial. The good in it will be retained, the evil, if any, rejected, and the world will have moved another step forward.

The great export movement which within a few years has altered the face of American commerce is the outward and visible sign of an inward growth in better methods of production. It is the result of progress toward that industrial freedom arising from self-help which contains the solution of many of our social and labor problems. Even a hasty glance over the manufacturing field shows that those of our industries that have succeeded in the world's arena are also those that on the whole pay high average wages, and whose operatives work under the best conditions for health and for large output.

Conversely it will appear on study that the industries, which do the least in the foreign field include those paying the lowest relative wages, and whose working force often operate under less favorable conditions of equipment and sanitation.

In the hearing before the Congressional Committee of the 62d Congress on Scientific Management in the government industries, two striking

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things took place. One was the testimony under oath of experienced manufacturers in different lines that the cost of production was cheapest where men were highly paid and provided with the best tools and working conditions. The other was the consistent testimony of trained observers that keen self-criticism was at once the first duty and the most profitable privilege of every manufacturer.

Within these conservative statements made in the quiet of a committee room at the New York Chamber of Commerce lies the germ of a social and industrial revolution.

If American manufacturers grasp and act upon the truth to which their fellows have sworn, the results upon them, upon their workmen and upon all consumers can hardly be measured. It means more profit for the first, higher wages with less effort in fewer hours for the second, and lower prices for the third.

It is strange that a people of such energy and resourcefulness as we are should have been so long content to think ourselves unable to compete on even terms with others, and should have held so long to the superficial and worn-out theory that the rate of wage we pay is the chief

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and controlling element in the cost of our goods, making them so expensive that they cannot be sold at a profit against foreign makers on even terms in our own country, much less in Europe itself.

But strongly as some of our industries still insist that their low wages must go still lower if they are to meet Europe on an equal basis of cost, other manufacturers have learned better. From West Virginia, a concern making glassware writes that its largest sales are in London and Germany, and it finds it wise to pay higher wages to produce goods for those competing markets.

In the same industry another company runs on such a basis that recently one of its workmen was earning eleven dollars per day while another earned but eight. What was the attitude of the management toward these men and their wages? Was it that if the man earning eleven dollars could be made to turn out the same product for half that sum the concern would profit thereby? Hardly! The course taken was to retain an efficiency engineer to show the manager how the product of the eight dollar man could be so increased by instruction and by creating right

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conditions that he could, without overstrain, bring his productiveness up to a point where he also would receive eleven dollars.

This manufacturer had grasped the truth that close and sympathetic coöperation between his men and himself was profitable to both, and a wise regard for his cost sheets, and an enlightened selfishness, both warned him that the policy of crowding the workmen to the largest product at the lowest wages did not pay.

Our industrial managers are divided into two camps, the fearless and the fearful, those who face the light and those who look to the past, those with open and those with closed minds, those who think they know and those who seek to know. The testimony before the Congressional Committee brought out distinctly also the fact that the effort for a keen study of factory conditions and a higher wage, based upon a greater product more easily and more cheaply made, meets its greatest resistance from mill owners and managers who call themselves conservative.

One is curious to know what men think they conserve when they say, as some do, that they can only face greater competition by reducing

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the wages of employees already paid an average of \$8.50 weekly. Indeed, so "left to themselves" are some manufacturers of this type that one of them deliberately worked his operatives into a position where they could not resist a cut in their wages, and when the foolish manager ordered the cut made, he said to his deluded self that he had saved \$65,000 per year by it.

Another manager stated that on one article he had cut his piecework rate five times. He not only thought this wise, but said his workmen had obviously been "soldiering" since at the former higher rates they had not turned out as large a product as when driven by necessity after the rate was cut. Under management of this kind conditions often exist from which spring indirect losses many times greater than the supposed saving in the pay roll arising from a cut in wages. But to these losses such managers are blind.

It was stated in October, 1911 at the Dartmouth Conference on Scientific Management that in one large mill the waste of money was such that a saving of \$1000 daily was possible, without touching wages, by the use of well-known efficiency methods. But the managers were so

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wedded to their own ways that the opportunity to make these economies was refused.

In company with a friend of wide experience in such matters I visited a large establishment in the East whose proprietor took pride in his extensive plant, and, indeed, with just cause, for many conditions there were ideal. There was fine light, abounding fresh air, and skilful arrangement of fine machinery. Yet a large part of the productive portion of the plant was on the average producing but two-thirds of its capacity, and the labor cost in the product was very much more than that of other concerns in similar lines.

Our host was in many ways as thorough as he was courteous, but he was controlled by the belief in himself natural to a strong man, and impressed upon us again and again the fact that he "knew his own business." Yet work went on by hand which was elsewhere done by machinery, and expense was put on some operations that a man who was a thorough self-critic would have found means to save.

Into the office of a large factory in New York state went one day a competitor of the concern who thought it courteous to call upon his rival.

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He was cordially received by the unassuming owner, and finding the atmosphere congenial, began to talk on matters of mutual interest. Being asked whether he had not secured a certain order, he answered in the affirmative, saying that that work was a specialty with him and that he had been able to reduce the cost for material and labor to about eighteen cents each piece. His host said that he had not himself given any special study to that particular article, and that he was very glad to have suggestions.

When the visitor left, the owner crossed the room to his cost-keeper whose eye he had seen twinkling and asked him what the last lot of those goods cost for labor and material, and was told six cents each. The trouble with the visitor was that he had no realizing sense of his own heavy burden charges, and ignoring them and forgetting selling cost he had underbid the man whose actual outlay was but one-third his own. This is but one of many possible illustrations showing that the man who "knows his own business" is often ill informed about important factors in it.

Whenever one meets industrial managers who are sure of their own knowledge and wisdom,—

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and there are such true industrial Bourbons in our country—who roll the word “conservative” under their tongues with sweet self-satisfaction, one has that sinking feeling common to those who try to enlighten hopeless ignorance. The really wise are not so sure of themselves.

But we emphasize that the scientific spirit in management seeks “the whole truth and nothing but the truth.” It is not content to stop its inquiry with the money cost of output in wages and material nor with the financial side of profit and loss. It has a keen eye for the human or social gain and for the physical or moral loss involved in factory operations. We must not only conserve in every way the health and vigor of labor, but also provide that it may work out its own happiness with wages that will enable it to live so as to maintain its self-respect and with sufficient leisure to enjoy and profit by mental and moral recreation.

The attitude of many employers towards the demands for shorter working hours has been far from that of a judicial spirit of searching inquiry into all the facts. It rather has been a cry of alarm, a call to resistance as against some iniquity about to be perpetrated. In a super-

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ficial way loss is assumed from an eight hour working day almost without any calm study of the subject.

I recall that in a New England city, famous for its municipal statistics, appeared the statement that three hundred per cent. of its Turkish population was criminal. A student, whose attention this fact aroused, investigated it and found that the Turkish population consisted of one Turk who had been locked up three times.

This is quite typical of the one-sided way in which statements are made about the eight-hour day. Associations of manufacturers cry out against it but their cries are as incoherent as they are loud. Abuse is showered on the labor organizations that promote the shorter day, but how little there really is of thoughtful study into all the phases of the problem. Yet we all know that hours of labor have been growing shorter for years, not only without hurt to all concerned, but to their actual gain. Men worked fourteen hours daily not long ago. Then it became twelve, then ten (but there was great outcry about it). Then nine hours became the rule in many a factory, and the *nine-hour day has paid*. Where men with open minds have applied brains

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to the problem, they are doing better in nine hours than they did in ten. They make as many or more goods and they cost less. Nor is the eight-hour day a new untried thing in industry. The great Zeiss work in Jena, Germany, introduced it and kept careful record of the results. At the end of four years it was found that the hours worked had decreased fifteen per cent. but the output per hour had increased over sixteen per cent. The well-known makers of textile machinery, Mather and Platt of Manchester, England, substituted the eight-hour day for a nine-hour day with entire success. Several of our railways have voluntarily placed some of their services upon an eight-hour basis.

The truth is that in this eight-hour matter we manufacturers are inclined, to use a homely phrase, "to squeal before we are hurt." For there are many phases of the subject we rarely discuss. How much do we really *know* about the effects of fatigue on production, especially as to its cumulative results? We were certain the nine-hour day meant loss as compared with ten hours, but it has not proved so where we have used our wits as we ought. Have we not been looking too much to rules of addition and sub-

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traction and too little to the physical and mental laws of human nature? A lot of money has been spent in delegations and conventions to resist the eight-hour day. It has escaped me if there has been any large outlay for a dispassionate study of the subject on all its varied sides. But whether it be more or less profitable financially is not after all the crux of the question. If the eight-hour day be *humanly* more profitable, it will come and may God speed it! Nor will it be found that what is best for humanity is contrary to economic law. There are no real antagonisms between truths.

It is useless to resist the laws of growth, but we need not reform rashly nor attempt to accomplish our work with an ax. That is to jump to the opposite extreme. The human force whose essence is growth (since it is a living force) must resent being held in narrow and rigid bonds. The vigor of its protest against hard conditions is normal. Labor cannot be content if it would and ought not to be content if it could with things as they are. It is of its very nature to climb upward. Growth, it has been well said, is impossible in industry without profits; it has been clearly demonstrated that

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profits cannot be permanent without growth.

We may as well face here one very common occasion for complaint among employers. Workmen and workwomen too, say some, are ungrateful. They do not appreciate what is done for them. When I hear this plaint I ask myself such questions as: how was it done for them? Why was it done? What was left undone? There is, one suspects, about as much human nature on the average in one person as in another. The owner, the foreman, the workman have points of strength and weaknesses in common. Did you make a gift to your workmen? They do not want gifts. Do you show them a charitable disposition? They resent it and ought to do so. Do you impose your ideals upon them? They want to live their own lives in their own way and are right. But candor, manliness, just dealing, courtesy, the spirit of a "square deal"—are these wasted? Not if thirty years have taught me anything.

I talked not long ago with an experienced builder who said, "I have been over forty years in active business as a contractor with never a strike."

I asked, "How did you do that?"

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"Just by treating my men on the level. I always tried to remember I was one of them myself."

A prominent labor leader in whose judgment I have much confidence said to me that there were two kinds of places where they found it difficult to organize the workmen. One was where the men were so harshly treated as to be cowed. The other was where they were so well treated as to be content. I can recall a factory where for over twenty years there has been no breath of dispute. Doubtless there are many cases where welfare work well done has failed to keep the peace, but in many, if not most, of these cases the seeds of failure were sown in the beginning or other conditions existed which nullified the good the employers sought to do. Workmen will say that "one swallow does not make a summer" and that flower gardens do not always pay wages. A share in a possible profit does not make good a cut in the piecework rate and "the boss" does not always know what goes on in the shop.

CHAPTER IX

"THE NEW INDUSTRIAL DAY"

IT is hard to realize in the ample spaces and broad areas of our land that there are dark industrial places, that men and women, and children also, are confined in foul spots and driven through long hours at pitiful pay for the means not so much of living as of existence. While thinking of the themes on which it has been my privilege to speak in earlier pages, there has come to me the recollection of the many neat, small houses that are so marked a feature of some of our factory towns, and of the airy, well lighted shops that are springing up in many places; and it seems as if these are the promise of the dawn of a New Industrial Day.

It is not my thought to advocate any sudden or radical change in method or action. I believe in evolution, slow, steady, patient, progressive, not in revolution which turns things quickly upside down. This is a case for the application of

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the Scripture phrase: "Come, let us reason together." More than anything else I dread in what should be a sober, serious weighing of facts and search for truth, the entrance of impatience or of prejudice, those twin enemies of calm judgment.

Let us enter in spirit one of our great factories and spend perhaps an hour there. We may hope that during that time we shall be unlike those of old of whom it was said that they saw but did not perceive; for our purpose in going into the works will be to look closely into what may be seen there and to think as carefully as we can about what we shall see.

At entering we see that the building was designed for its use and the primary essentials of space, light and air have been given thought. In the older day which is closing, the workmen were furnished large drafts of carbon dioxide to consume with the other materials placed at their disposal and there was not always appreciation of the fact that light had a relation to the human eye, but in our present factory these things are changed. The building, also, has been so designed that the flow of work through it is continuous, for industrially we have learned the

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force of the old Roman maxim — "Not a step backward." The machines are grouped each according to its kind, like the animals in Noah's Ark. There used to be a cheerful distribution of these things, as if a lathe were not comfortable unless a shaper and miller were side by side with it, or a planer were married to a drill press. But we have divorced them now and we group three or four or ten of a kind, each in its order for the proper routing of the work as it passes through the shop. We go even into the details of these groups and so relate the machines, one to another, at different angles that they may be properly fed without trespassing on space, and we put racks beneath them so that an abundance of material may be piled at hand to avoid loss of time by needless steps when new stock is needed for the automatic machinery. All through, the whole machine equipment shows the evidence of study how each unit shall not only be fitted to its task and be given the best conditions in which to perform that task, but each shall be so related to its fellow-unit that the task of the fellow shall not be hindered but helped.

And since these buildings and machines are meant for production and are all of them useless

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waste unless they produce, and are none of them sources of profit unless they produce efficiently, we look into certain other details that bear upon these factors. We have discovered, for example, that a belt running on the old tight and loose pulley is always under tension, and even when running on the loose pulley is wearing itself away. We have taken up a form of counter-shaft in which the loose pulley is slightly smaller than the tight pulley so that the belt runs free of tension when not working, with a slight conical section on the loose pulley to bring it easily into place when its services are required. We have found that the matter of getting the power to our machines is worthy of our thought, and in the factory we are visiting some machines are directly motor driven, others so driven in groups, others connected up in sections, each according to what study has shown to be normal to its best productivity. We find also that a "tickler" of belts is kept for study which has shown that belts at a certain age and in certain uses have a definite life, and that when they have become so old it is necessary to watch lest by some sudden breakage they stop a valuable machine. So each

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belt in the shop is no longer under general but under particular supervision, the time when it may be expected to show wear being known when the belt is put in service new. And our belt men work in the noon hour and after hours for it is good form to watch the belts so that repairs are made before wear goes too far. We find also that we have gone into what seem small details in other ways. The shop we are in does not make its vise benches of heavy hardwood plank, for these warp and when they wear in spots it is needful to replace more sometimes than is worn. This shop has made its benches of heavy softwood plank and on the top of them puts crosswise thin and narrow matched strips of hardwood, any two or three of which when worn can be replaced without disturbing others or interrupting work.

It would be possible to continue our factory inspection into other details but enough has been done for our purpose and we will go for a moment into the tool and stock rooms. In the former, not only is care taken that tools, as they come back from use, are sharpened or repaired so that there may be no question of their readiness for service when they are reissued, but to

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save what seems a small detail in records we indicate the number of tools or fittings that any one workman has by the shape of his brass check hung upon the hook. In the stock room is kept a running inventory on slips attached to every bin so that the question as to how many there are of any item in the assorted stock never arises, and not only so, but there is provided an inward and an outward bin for each item of stock, and sometimes a third one maintained at a fixed quantity to save questions.

From this atmosphere of precision we walk back to the shop office. The superintendent tells us that the material bought has been selected as the result of long evolution as to its chemical and metallurgical contents, its shape and size, and that frequent examination by physical and other tests is made to insure its being perfect in all these respects, while at the same time constant experimenting progresses to determine whether there is made, or can be made, something better suited to the duty or something at a lower price as well suited thereto. And as we sit down in his pleasant room, the superintendent goes on to say that he has reached the point on some machinery where he secures ninety-six per cent.

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operating time and that he is studying how to bring his lathes above the eighty per cent. of efficient time which is what they at the moment represent.

I have dwelt thus long, and yet very inadequately, upon certain details of certain phases of a modern shop in order to concentrate on a single broad truth underlying all that has been said. This is that in our buildings or machines or various equipment and in our material, the most exacting study has been used to fit each for the purpose for which it is intended. We have spent, or others have spent in our behalf, years of patient experimenting and sums that thousands will not represent, to determine how best to adapt all these various elements to one another so that their relations shall be harmonious, productive, efficient and economical. By economy we have not meant the absence of spending, for these machines and these methods have cost much through many years, but we regard it as well spent. As between the man who offers a machine as a cheap tool and another who asks a greater price, we think first of the question, "What will these tools do?" and it is the relation of their productiveness to their cost that

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guides our decision. Let us suppose that, in the shop we have just visited in our thought, the present modern equipment were replaced with another of similar kind but selected chiefly because it was cheaper in its first cost. The result would be disastrous, for, as regards machines, it has been clearly demonstrated that productiveness is more important than first price.

One more look into that shop before we change our theme. The material in the stock room, the carefully designed tools in the tool room, the machines selected and installed with equal care, these are all dead things. Turn on the power and the light and if that be all that is done such action as results is more likely to be disastrous than effective. They will follow the laws of their mechanical nature and wreck themselves unless the conditions for useful work are provided. There are few places more dreary than a great shop alone with its dead equipment; like a steamer in mid-ocean when the engines stop, there is a sense of the absence of life. Let us look along the lines of polished machinery and upon the piles of ready material, and on the varied accessories, and think for a moment of the next step. Is there to be an end at this point of the

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study and the patient care that has guided us so far? Is the process of economical investment based upon production to be changed just at this point? Having the best equipment bought and arranged with its cost as a secondary factor and its productiveness as the primary factor, shall we put at these machines men whose cost is first to be considered and whose productiveness we aim to extract by a process called "shop discipline"? Having with great care fitted tool to mechanism, shall we, or shall we not, use equal care to fit the men to both? Having utilized the laws of light and of power and of mechanics to the full, intelligently and carefully, shall we, or shall we not, now utilize the laws of human nature to the full with the same intelligence and care? Shall we recognize that at the point where our thought is halting, we are passing over from the inert to the responsive and that in addition to all the other laws and conditions under which we have so carefully worked hitherto there has come into play a new law now, the law of life and growth and thought?

Here we touch the very core of our subject and upon the way in which we deal with it, shall it be known whether we are of the light or of the

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darkness, for our fine equipment with its perfectly balanced relations may mean after all that we have learned but the smallest part of our subject, and that the full light of day has not yet dawned on us. I do not here urge details of dealing with men any more than details of the tools and materials we see, but I do urge that as the laws of nature are utilized by us all after keen inquiry into them in the mechanical and material side of our work, so the laws of human nature shall be given at least as keen study in the living and productive side of our work. For since both the laws of mechanics and the laws of human nature are but a partial manifestation in my thought of the Law of God, there can be no harmony and no basis for permanent peace and for the highest production until we have re-adjusted our factories so that they operate in accordance with the laws of human nature. Is a man doing the best he can when he runs his machine tool well? Perhaps, and perhaps not. In a large Eastern shop recently a young mechanic at a fine turret lathe was producing certain work at low cost while earning high pay. The element of labor cost was so small in his product that the Cost Department had to use a

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microscope to find it. This was good, but was it all the good there was to be had from the man? As we talked with him he spoke with a smile of having earned fifty dollars extra the week previous for an improvement of which he had thought while his turret lathe was working. He reflected upon it, and knowing that his employer was a man of broad and just spirit, he had, after working his thought out carefully as he stood by his machine, gone to his employer with his idea. The employer had not only thanked him and given him demonstration of his good will by liberal wages, but had handed him fifty dollars besides. Thoughtful men need not be told that the narrowness and harshness which is concealed sometimes behind the words "practical" and "hard-headed" would have prevented such ideas from ever being conveyed to the owner of a shop run on those lines.

I recall one day being asked to look at a running machine and having the workman say to me, "If this tool can be adjusted in such a way, I can do twice as much." Does anyone suppose that stern and narrow discipline would have brought that doubling of product? In this enlightened day it may perhaps be doubted whether

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and to what extent there exists such shortness of vision and narrowness of outlook as that of which I have spoken, but it was a matter of sworn testimony before me but a few weeks ago that in a large shop a mechanic, whose record was good, was kept at home three days by the death and funeral of his son. When at the end of that time he returned to his work, he not only lost the three days' pay but his absence was counted against his efficiency record and so altered that record as to cost him twenty-five cents a day for the following half year, and his explanation, though admittedly true, was not received because discipline had to be maintained.

It was true also in another case where a man was quarantined in his home by the authorities because of scarlet fever that, when he returned to work at the end of a fortnight, he lost not only his wages for the time of absence, but was demoted on his efficiency record because of the absence so that he lost twenty-five cents daily for six months to follow, even though his explanation was admittedly correct. It seems strange that those who so carefully adjust themselves to one part of nature's laws in their plants should be so hopelessly ignorant of another part of those

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same laws, when they come to deal with men. Is there anyone who wonders that the two cases I have mentioned so rankled in the minds of the hundreds of workmen in that factory as ultimately to cause annoyance and expense to the management, outweighing many fold the pitifully small questions of wages involved?

Let us look briefly at the situation in the textile mills at Lawrence, and get at some facts concealed by the dust of conflict there. The mills had some time ago accepted a reduction of their working time from fifty-eight to fifty-six hours without change of pay, and a recent legislature reduced the time for the women and children in those mills to fifty-four hours weekly. This required shutting down the mills two hours each week because they were so balanced that the men could not work in some departments unless the women worked in others. The difference in time was two-fifty-sixths, a fraction less than four per cent., and the mills decided (observe, not all mills upon whom this bore, but some of them, those in this one city) they decided, I say, that this percentage must be deducted from the wages of their people. Those wages were already far below the average American wage. A

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rate of six dollars and fifty cents weekly would represent the average woman's earnings before the cut was made. A strike ensued and by that strike has been lost many times over a year's difference in wage. Apart from this money loss there has come with it the ill will and distrust of thousands of operatives, and now, after the distrust has been gained and the loss has been incurred, the mills concede an advance wage scale about one-half larger than the cut which they made at first. So by their own action they have shown that despite the loss from weeks of idleness, they can pay an advance and that the former deduction was made, to say the best, in ignorance, for if made with knowledge, it approached the criminal. I do not mean in any degree to approve the excesses of the strikers, any more than I mean to approve excesses, so far as they may have existed, on the part of the authorities. I simply mean to detach these excesses on either part and to consider the fundamentals of management and their results. The mills are now paying more wages than before the strike and paying them to a force resentful of injustice, for the most ignorant man knows that if the mill can advance his wages five per cent. after the

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loss they have suffered, the original cut of less than four per cent. was a shameful thing.

Of late, and with just cause, there has been universal outcry against the excesses to which some men, claiming to represent labor, have gone and there is a certain danger that injustice may be done as a result of this righteous wrath. Crime is horrible and always to be condemned, and murder is not to be condoned; but there are crimes against human nature that are not within the scope of the statute law, and the revolt of human nature against them has as sound a basis as our proper outcry against the more overt criminal act. If greed kills through sweating and child labor, it is not less murderous, only less rapid and less merciful, than he who stabs to slay. With the men that enter our factories, enters the greatest force in all production; I mean the responsiveness of those men to leadership. They work indeed because they needs must earn their bread, and it is needful that supervision should be closely exercised for manifest reasons, but neither the need for bread nor the closest supervision will draw out the best that the workman has to give. That can only be done by the righteous adjustment of wage to product; by the

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absence alike of injustice and of charity; by the opening of the door of opportunity; by the absence of driving and the presence of leading; by the selection of the man for the task and the adjustment of the task to the man; by the instruction of the man in his task or if unfitted for it, then in some other task for which he is more fitted; by the spirit of candor and frankness between the employer and the worker; by the willingness to hear and to wait; by the closest possible touch practicable in great factories between the management and the working force. It has been said that corporations have no souls; this is a pity, if true, for the men in the shop have souls, and the coming in to the minds and hearts of the men that run the corporations of sufficient soul to give them a basis for appeal to and coöperation with the souls of men at the machines may make the difference between profit and loss to the corporation.

Finally, many of us have stopped too soon on the path of scientific development of our industries. The man is infinitely well worth study and infinitely more difficult to study than the machine. Does it not come to you with something of a shock that we are all careful to have

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a machine heavy and strong enough for its work, but that we rarely think whether a laborer may have some heart trouble or some other physical weakness that makes him unfit for the heavy lifting we ask him to do? We all believe in clean shops, but do we think enough of the human element to be careful to avoid sweeping when the men are about because of the well known fact that dust carries all manner of disease germs which men breathe? The working out of the machine has been a long evolution and the working out of the study of men may also be a long evolution. It cannot be hastily done. It requires patience; so did the machines. Your machines are complex; how much more so the man with his human mind and heart. But if patience is exercised, there is in the man the responsive spirit the machine lacks, and that spirit led and not driven, guided and not abused, is a power in industry of which the wisest of us do not yet dream. Without it, we may be able, or we may not, to profit temporarily. With it, the age of industrial conquest opens.

There are those I know wishing to ask such questions as: "What about the closed shop? Do you approve it?" That is not hard to an-

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swer. I do not approve the act of any man or men who would deny to another the right to work at any lawful occupation when, where, and for whatever wage, he will. Still less do I approve the continuous making of profits where wages or working conditions exist that cramp manhood or degrade womanhood or stunt childhood. I recall no policy ever avowed by labor that is a worse offense than the sweat shop. To accept dividends or profits out of human conditions that prevent a decent living is quite as bad as, perhaps worse than, to demand a closed shop. Let me insert here two little verses by Berton Braley.

THE REAL GUIDE

You may bring to your office and put in a frame
A motto as fine as its paint,
But if you're a crook when you're playing the game,
That motto won't make you a saint;
You can stick up the placards all over the hall,
But here is the word I announce,
It isn't the motto that hangs on the wall,
But the motto you LIVE that counts!

If the motto says "Smile" and you carry a frown,
"Do it Now," and you linger and wait,
If the motto says "Help"—and you trample men down,
If the motto says "Love" and you hate,
You won't get away with the mottoes you stall,
For Truth will come forth with a bounce;
It isn't the motto that hangs on the wall,
But the motto you LIVE that counts!

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But it will be urged that the representatives of labor are sometimes unreasonable. I presume they are. I have heard labor leaders, whom I trust, say so. I have known labor leaders struggle hard and unselfishly to prevent their own followers from being unreasonable. But the answer to the charge is easy. Let him that is without sin among us cast the first stone. If we are always sure we are entirely just and wise, there may be less unreasonableness found on our path.

What then does the new industrial day involve? Profits are no longer the supreme law. The regard for the legal rights of the citizen is expanding into a recognition of other rights, moral, physical and personal. If we are not becoming our brothers' helpers, we are ceasing to be our brothers' destroyers. We are thinking more carefully how far man may rightly fatten on man. The public looks no longer with patience on reducing wages to maintain profits or dividends. Even to cheapen costs on a falling market, it is no longer thought just to pay workmen less for the same labor. More and better things are expected than a constant struggle between profits at the top and penury at the bottom in the same establishment.

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Will the business world recognize the new order and face it fairly and squarely and meet it half way? If so, well for the business world. Will the business world simply "stand pat?" Then ill for the business world. Attorney-generals come and go. Laws are made and changed and repealed. They arise from the spirit that is abroad in the land. Both are non-essential details if the spirit is right. Will the business world go on as it has gone heretofore? Then the laws and attorney-generals are needed. Will the business world accept the larger spirit of the new day? Then attorney-generals and laws are harmless. No ill threatens any great industry whose spirit is first that of equity and liberality to its workers and to its consumers and second to its own profit. But where profit is first and is to be had at any cost of human fatigue, or poverty, or evil conditions, or at the cost of special privilege extracting high prices from the consuming public, then ill does threaten that industry. There are slow and sure paths to profit and quick and dangerous roads that seem also to point that way. We can mistake conservatism for conservation and end by all falling into the ditch.

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The new industrial day means not compromise but comprehension. Not alone humanity or welfare work, though these are good, but a larger outlook, a spirit of earnest self-criticism looking inward, and the spirit of "lend a hand" looking outward. It means care for our profit's sake, and for our manhood's sake, for the growth of the men by whose efforts we prosper. I say "growth of the men," not merely increase of the wage; for a living wage means more than food or clothes. Our industries must stimulate and not shackle the growth of all the elements that mean uplift and progress for our workmen. This is not an appeal to one's sympathy or sentiment. In our use of human forces we must study those forces as we study others, learn the facts and adapt ourselves to them.

A great factory should be in a sense like a school, for all in it are learning, master and men alike, and no limit can be set to the attainments of him who hath a teachable spirit.

We shall not reach the needed results of the best methods of industrial management until we can speak of our factory towns in a paraphrase of Holy Writ, saying: "The cities shall be full of happy people working in the mills thereof."



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